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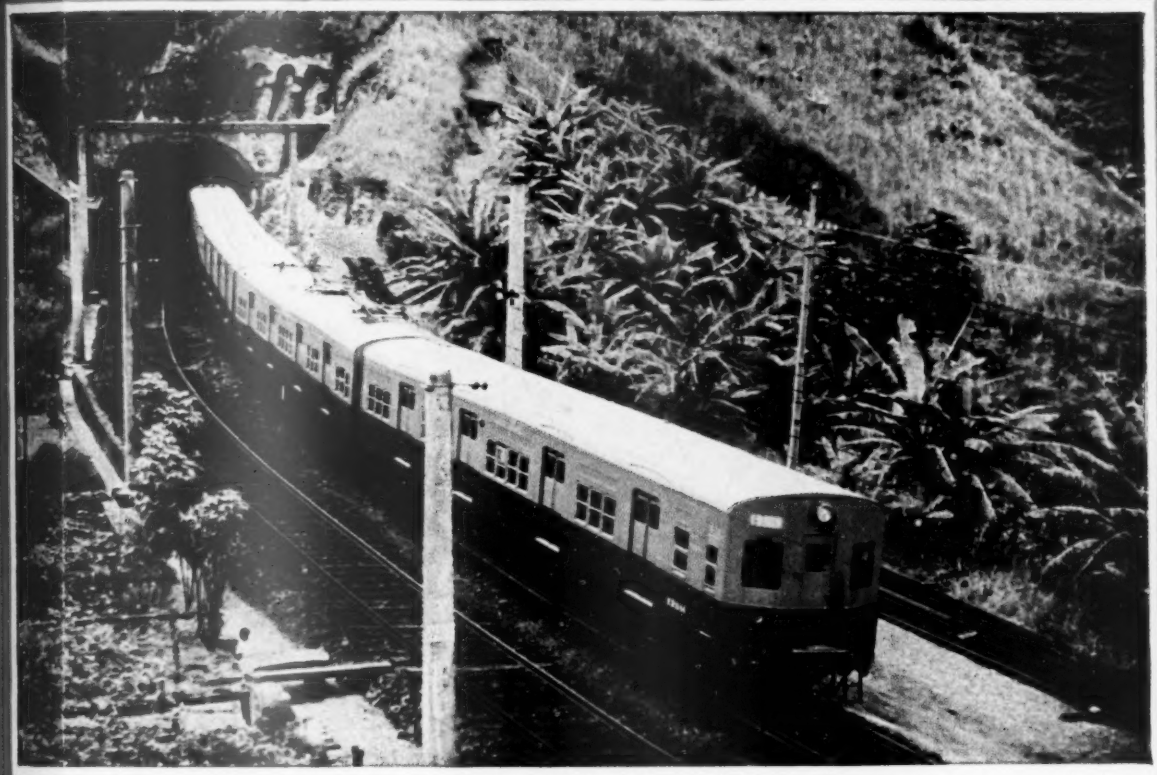

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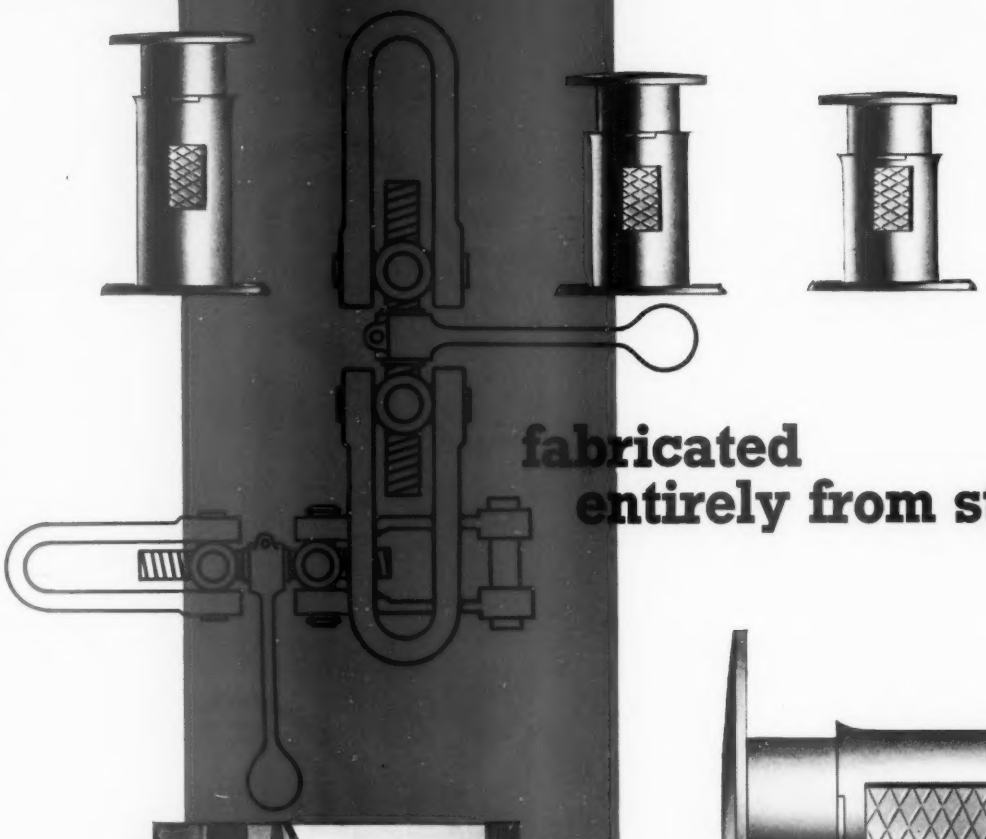

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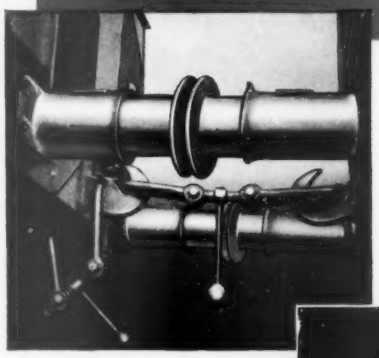

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## CONTENTS

| | Page |
|---|---|
| Editorial Notes | 289 |
| Railwaymen's Plan for Transport | 291 |
| Transport After the Election | 292 |
| Western Region Winter Passenger Services | 292 |
| Signalling for 50-cycle Electric Traction | 293 |
| The Denver & Rio Grande Western Railroad | 293 |
| Letters to the Editor | 294 |
| The Scrap Heap | 295 |
| Overseas Railway Affairs | 296 |
| Progress in Railway Weed Killing | 298 |
| Traffic Manager's Office at Doncaster | 302 |
| L.M. Region Mobile Signalling School | 303 |
| Bridge Reconstruction on the Central Railway, India | 305 |
| Constant Horse-power Diesel Locomotive | 306 |
| Personal | 309 |
| New Equipment and Processes | 312 |
| News Articles | 314 |
| Contracts and Tenders | 317 |
| Notes and News | 318 |
| Railway Stock Market and Official Notices | 320 |

### Government Unchanged

THE result of the General Election has seen the return of the Conservative Government with an increased majority of 100. The final state of the parties was Conservatives 365, Labour 258, and Liberals 6. The Conservative majority in the previous Parliament was 56. The fact that the Tory party has been returned to power with a decisive majority for the third successive time establishes a parliamentary record. From the point of view of the British Transport Commission, the fact that there has been no change in government should, at least, preserve continuity of policy in relation to its affairs. It would have been particularly unfortunate at this time, when the position of the railways is critical, if there had been any reason for a reassessment of government attitude. Even had the Labour administration been returned to power, it is hardly likely that early fundamental changes would have been made, but there can be no question that an element of uncertainty would have been introduced into policy which would have been undesirable. From the viewpoint of other important basic industries, such as steel, the continuity of government will remove fears of nationalisation, at least for a considerable time to come, and will enable planning to go ahead with greater assurance than has been possible in recent months. The reaction on the Stock Exchange to the news suggests that there is every expectation that under the present administration trading and business conditions will continue to improve, and this should have a favourable reaction on railway traffic through the carriage of both raw materials and finished products. The avowed policy of the Conservative administration of greater prosperity, reward of enterprise and reductions in taxation should prove a stimulus to industrial activity of all kinds. Export business also should be assisted by the removal of political uncertainties and sterling should be buttressed by the removal of apprehensions abroad that national resources might be dissipated in unwise and uneconomic expenditure.

### Ministerial Appointments

MR. HAROLD WATKINSON, now appointed Minister of Defence, who has held office as Minister of Transport & Civil Aviation since December, 1955, with a seat in the Cabinet since January, 1957, has applied himself with energy to his many tasks. Prominence has been given to his activity in forming and executing Government plans for building roads, but he has given vigorous support to implementation of the plan for modernising and re-equipping the railways. When he assumed office, the plan had been launched only a few months previously. Financial stringency, increases in prices and other factors have necessitated modification of the original proposals, but Mr. Watkinson has shown himself aware of the necessity for an efficient railway system, in representing the railways' case and in securing from the Government the financial help which has enabled implementation of the modernisation plan to continue. Success in this direction is largely the result of his close co-operation with the British Transport Commission with which his relations have been harmonious. He is succeeded as Minister of Transport by Mr. Ernest Marples, who has displayed great energy as Postmaster-General in modernising postal and telecommunications services. Mr. Duncan Sandys is the new Minister of Aviation, a separate portfolio from Transport.

### The Role of Railway Shipping Services

FREIGHT, parcels and mails receipts of British Railways shipping services in 1958 totalled some £8,600,000, of which £5,300,000 was derived from Continental and Channel Islands services. A substantial contribution, therefore, was made by railway ships to the £260,000,000 which the Government estimates was gained by the national economy last year through "invisible exports" derived from British dry cargo shipping. The value of this to the national balance of payments was stressed by Mr. R. G. Grout, Chairman & Managing Director of the General Steam Navigation Co. Ltd., in his Presidential address given last Monday to the Institute of Transport. The nature and degree of competition between sea and air, he pointed out, had been greatly exaggerated in the public mind. The two types of transport in their respective ways served essential and complementary needs. The air provided swift transport for passengers, light mail, and small freight. The sea could carry in a more leisurely manner large numbers of passengers in greater comfort, and also bulk cargo in a manner and at a cost with which the air liner would never be able to compete.

### Modernisation in Perspective

A REVIEW of the implications of the plans for modernisation and re-equipment of British Railways was made last Wednesday by Major-General Ll. Wansbrough-Jones, Secretary General of the British Transport Commission, in his paper to the Southern Region Lecture & Debating Society. The term "modernisation," he pointed out, tended to be applied loosely to new works and new equipment of any kind. Before the war of 1939-45 the usual term was railway "development." He mentioned some past development schemes on railways in Britain and abroad. He interpreted the term "modernisation" as a comprehensive scheme, deliberately pre-planned and aimed at equipping, in its widest sense, a railway system to undertake tasks which had grown different in character as more competition had appeared, and also to ensure that the railway could make its due contribution to the economic life of the country. The British Railways plan was related not only

to the full utilisation of modern equipment but also to "a purposeful concentration on those functions which the railways can be made to perform more efficiently than other forms of transport." It provided, *pari passu* with the placing in service of new equipment, for the streamlining of the traffic organisation, the modernisation of the goods charging system, and increasing productivity through new methods of analysis and work study.

## Engineers' Salaries

A SURVEY of the earnings of professional engineers in Great Britain in 1955-56, based on information supplied by over 6,000 engineers, was published earlier this week by the Engineers Guild in its journal *The Professional Engineer*. The study, conducted by the Government Social Survey, covers some 6 per cent of the membership of the Institutions of Civil, Mechanical, Electrical, and Chemical Engineers. It shows that in 1956 half the professional engineers in Great Britain earned less than £1,200 and 30 per cent under £1,000 a year. Only one in four received more than £1,600. The Guild states that the higher remuneration of engineers in the U.S.A. and Canada, and a decline in the standard of living in Britain in the past 20 years resulted in emigration to North America in 1954-56 by members of the four chartered Institutions at a rate 9 per cent above that of the increase in membership. Particulars supplied by 138 engineers under the heading of "transport" show that earnings in 1956 were roughly 10 per cent below the national average. In commerce and industry, excluding nationalised industries, the incomes of some 2,500 engineers were about the same as, and in the upper ranges above, the national average.

## Railway Links in Africa

THE link now to be surveyed between a point near Ruvu, on the Tanganyika Central, and Mnyusi, on the Tanga line of East African Railways & Harbours would help the railway to compete for traffic between Kenya, Uganda, and northern Tanganyika on the one hand and Dar-es-Salaam and central and southern Tanganyika on the other. It would also benefit traders who consign by rail, and contribute to the economic development of the three territories. By providing a physical connection between the two major separate groups of E.A.R. & H. lines, it would facilitate transfers of rolling stock and motive power to and from works and to meet traffic demands which may fluctuate according to harvests. Completion of a Cape-to-Cairo railway seems remote. The next gap to be closed would seem to be Ruvu-Mnyusi, if construction is approved. The next link to be built thereafter might be that between the Tanganyika Central and Rhodesia Railways. Completion of these two links would afford a through route between Uganda and the Cape. A north-to-south route west of the Great Lakes seems unlikely The big gaps remain between Soroti, in Uganda, and Roseires West, southern terminus of the Sudan Railways; and, in Egypt, from Wadi Halfa down the Nile to Shellal.

## Southern Region Electric Boat Expresses

ELECTRIC operation of boat expresses by British Railways, Southern Region, between Victoria and Dover Marine via Chatham facilitates good running combined with high productivity. The down morning Ostend boat train for instance is allowed 92 min. for the 78 miles. The composition at peak traffic periods is three four-car multiple-unit sets and two motor luggage vans. Some 600 passengers, besides registered baggage, have been conveyed with a train crew of two or three: motorman, guard, and, occasionally, ticket inspector. Electric multiple-unit expresses of the Southern Region and its predecessor, the Southern Railway, such as those between Waterloo and Portsmouth, for a good many years have carried heavy passenger complements with only a motorman and guard. The electric Dover boat expresses represent considerable revenue from Continental traffic in relation to manpower user. The power available in the train of 14 vehicles weighing 528 tons tare is 250 h.p. from each of two motors in each of the three four-car sets and 250 h.p. from each motor luggage van, or 2,000 h.p. in all. This enables schedules to be maintained over a steeply graded and heavily trafficked route.

## Through Routes in the Middle East

THE success of the Iraqi Republican Railways in maintaining upper-class passenger traffic in a climate of extreme temperatures, with much travel through desert, is due largely to air-conditioning. Coaches with Stone equipment are run in all the metre-gauge main-line trains and on the broad-gauge between Baghdad and Mosul. Through sleeping cars of the Wagons-Lits Company run between Haydarpasa, on the Bosphorus, opposite Istanbul, and Baghdad. Travel by this overland route to Iraq and Persia will be improved when the Baghdad-Basra main line is converted from metre to 4-ft. 8½-in. gauge. This will afford through running between the Bosphorus and the Persian Gulf, but the through railway route between Turkey and Pakistan and India will not pass through Iraq. Construction is reported to be in progress on the sections in Turkey and Persia which remain to be completed. The problem remains of the difference in gauge between the standard-gauge railways of Europe, Turkey-in-Asia, and Persia and the 5-ft. 6-in. gauge system of Pakistan and India.

## Improving Goods Traffic Routes in North India

ONE of the hardest-worked single lines in India is that from Allahabad to Kanpur. It carries the major portion of the mineral and goods traffic from the coalfields and industrial areas of Bengal and Bihar to Saurashtra, in the west, Ahmedhabad, the cotton milling area in Bombay State, Agra, Delhi, and Kanpur, itself a great industrial centre. Traffic outgrew line capacity some time ago, and already seven or eight down goods trains daily have been diverted to the rather longer, and roughly parallel, route on the other (north-eastern) bank of the Ganges via Unchohar and Unnao. The main direct line 121 miles long is now being doubled. The first 60 miles are expected to be in service by the end of this year. There is moreover another, though considerably longer, alternative route between Allahabad and Kanpur, the Central Railway line via Manikpur, Banda and Bhimsen. As described in an article on another page, the standard of this line is being raised very considerably to enable it to provide further relief to the direct route when the great volume of additional traffic from the Bihar steel plants begins to flow northwards. With that article is a map showing the various routes mentioned above.

## Railway Weed Control

THE problems attached to the control of weeds on and around railway sites must be faced by every railway administration. This week we publish an article by a well-known authority on weed control—Dr. G. S. Hartley, Director of Research at Chesterford Park Research Station, near Saffron Walden in Essex. While giving particular attention to methods applicable in British conditions, Dr. Hartley also touches on the use of herbicides in general, the precautions which must be taken against toxic properties, and the adverse effects on electrical equipment of some weedkillers. Although attention to specifically railway problems has occupied Chesterford Park within only a relatively recent period, the knowledge and experience which have been brought to bear on the difficulties involved have been gained over many years of study over a wider field. This knowledge is now at the disposal of British Railways, which has appointed a working party to act as a liaison between it and Chesterford Park to examine the findings of research and to ensure that the most effective and up-to-date methods of weed control are adopted over the British railway system.

## Aluminium Wagons

AS far back as 1928 an 8,000-gal. tank wagon was built in aluminium in the United States, and a few limited experiments in aluminium construction have been carried out since that date. But at last there is to be a full-scale introduction for, at an estimated cost of some $25,000,000, the Southern Railway, U.S.A., has ordered no fewer than 1,205 bogie wagons with aluminium bodies on steel underframes. These will all be open or covered hopper wagons, with the high capacity of 103 tons (92 tons of 2,240 lb.) apiece; the open wagons, with bodies 50 ft. long inside, 11 ft. wide and 11 ft. high, are intended mainly for the carriage of coal, but also of

cement and grain. One major advantage of using aluminium is the reduction of tare in proportion to paying load; three of the new wagons will carry 13 more tons though weighing 43 tons less than four conventional wagons of all-steel construction. Though each aluminium wagon will cost $20,000, as compared with $7,500 for an all-steel wagon, the Southern Railway expects to economise by at least 32 per cent on the cost of the new wagons even in an unfavourable year, and by as much as 60 per cent in a good year.

### Advertising the Hook of Holland Night Service

A GOOD night's sleep in a comfortable cabin, and arrival at destination in the morning in time for a day's business are features of travel to the Continent by the Harwich/Hook of Holland night service featured in advertisements by British Railways, Eastern Region, in the national daily newspapers. Emphasis is rightly placed on the combination of comfort with economy of time. Leaving Liverpool Street at 8 p.m., the business man can be in Amsterdam by 9.15, Düsseldorf before 10, Cologne at 10, Bonn just after 10.30, and Brussels by 9.30 a.m. The steamers of British Railways and of its predecessors, the former London & North Eastern and Great Eastern Railways, have been well known for the high standard of their appointments and service for many years. Emphasis also is laid on the excellence of the dinner served in the " Hook Continental " between Liverpool Street and Harwich Parkeston Quay, with a reminder of the quality of the wines available in that train. The latter is a feature on which British Transport Hotels & Catering Services are to be congratulated in respect of not a few expresses.

### Overrunning an Intermediate Signal

THE collision between freight trains in a fog at Hitchin on November 19, 1958, arose from a driver failing to respond adequately to distant indications, overrunning an automatic semaphore and not acting with the required prudence on suspecting his mistake. A third train ran into the wreckage. A.T.C. equipment is in position on the ground at the distant and colour-light signals on this line but the colliding engine had none; had the driver been able to receive audible warnings he might have been led to act with better judgment. As will be seen from our summary in this issue of Brigadier C. A. Langley's report, the accident raised more than one interesting and important point, including the working of 12 hr. signalbox shifts, at times unfortunately unavoidable under prevailing conditions, and the problem of " reading through," felt particularly since the colour-light signal appeared, the aspects of which are rather more powerful than is strictly essential in darkness in clear weather, but are extremely valuable when visibility becomes impaired. Dimming at night is resorted to in some countries, as it was here during the war, but involves special controls and equipment; these offer problems of their own and British railway authorities have preferred to do without them.

### Constant Horse-power Locomotive

COLLABORATION between Hudswell, Clarke & Co. Ltd., Davey, Paxman & Co. Ltd., and Fluidrive Engineering Co. Ltd., led to the creation in 1954 of the first constant horse-power diesel locomotive, the *Enterprise* of 210 h.p., for heavy shunting duties. This made possible development of the *Enterprise* Mk. 11 B, a 2-ft. 6-in. gauge passenger and freight-haulage locomotive of which 16 are being supplied by Hudswell Clarke & Co. Ltd., to the Sierra Leone Government Railways. A description appears elsewhere in this issue. The Davey Paxman " Hi-Dyne " constant horse-power principle results in a uniformly-high power obtainable at the track over the entire locomotive speed range. Control of fuel injection is through an Ardleigh governor which reduces the engine torque as the speed rises. Thus a speed-tractive effort curve approaching the ideal for rail traction is achieved at slight sacrifice of peak output in the higher speed range of the chosen basic engine design, but, by turbo pressure charging, without imposing a thermal loading on the engine in excess of that found at the normal full rated power and speed. Dual Fluidrive couplings enable ratio changes in the integral two-speed gear-box to take place automatically and without interruption of effort.

## Transport After the Election

WITH its increased majority, and the Labour Party Opposition ranks depleted of some former members who showed an active interest in transport, the new Government is free to pursue a transport policy without fear of effective obstruction in Parliament. This is all to the good. It was always contended by Mr. Harold Watkinson, when he was Minister of Transport & Civil Aviation in the last Government, that the greatest need of transport was to be kept free of politics. In this view he was supported by the Conservative Transport Committee. We have consistently urged such freedom in these columns. Nevertheless purely political considerations have been evident in some action taken, and in debates and questions on transport matters in recent years, sometimes to the detriment of transport in this country in general, and more particularly to that of the nationalised transport undertaking. It is to be hoped that in so strong a position the new Minister will follow this precept in taking steps to solve the difficulties of the British Transport Commission.

British Railways traffics continue disappointing and everything points to loss for this year being not far short of that for 1958. The additional borrowing powers to meet deficits and interest thereon voted by Parliament last year will almost certainly be exhausted before the Commission again breaks even, that is, before the latest predicted date of 1963, and during the probable life of the new Parliament. Decisions must be taken soon on the manner in which the finances of the Commission can be reorganised so as to enable it to pay its way. In the report published in the summer as a White Paper, containing the reassessment of the modernisation plan for British Railways and a review of the financial position of nationalised transport, the Chairman of the Commission, Sir Brian Robertson, indicated that the accumulation of indebtedness would impose so great a burden of capital charges that some action to relieve it of part might become necessary. The Minister of Transport and the British Transport Commission will have to decide on remedial action, which might include the capital reconstruction mentioned on the following page.

Before Parliament was dissolved proposals were believed to have been made by members of the Conservative Transport Committee for the hiving-off of certain ancillary undertakings of the Commission, such as hotels. Powers moreover still exist for the disposal of certain of the nationalised road haulage companies, notably the Pickfords, " smalls " and parcels and meat haulage sections, besides the road passenger interests. Some back-benchers are known to favour exercising them. While there may be a case for some disposals, as for instance of an hotel which is no longer ancillary to the railways, the several various undertakings of the Commission have been increasingly co-ordinated in recent years. Any disruption such as occurred with the previous road haulage disposals would be undesirable. It would handicap the Commission by distracting it from its difficult enough task of striving for financial equilibrium and would arouse that political controversy from which the transport industry must be kept free.

More important than further breaking up of the nationalised transport undertaking in such a way is the pursuit of a transport policy which aims at the best use of the several forms of transport. That is to seek, for instance, by quoting the lowest possible rates, to attract traffics to the most efficient and economic means of transport, and thereby to keep transport costs to industry at a minimum. It has been suggestedth at the road-building programme of the Government be related to modernisation of the railways. The Government is pledged to increase expenditure on roads, which is necessary if traffic along them is to be kept moving, road traffic congestion relieved, and the toll of road accidents reduced. There may be substance in the criticism by the Select Committee on Estimates that too great attention was being paid to new fast roads linking towns and insufficient to improving the position within urban areas. It would appear that the roads programme is out of balance. It should now be reviewed and its relationship to the railways taken into account. With road passenger transport the increase in the number of privately-owned vehicles is having an adverse effect on public services, especially in London and the rural areas. A committee is inquiring into the latter and it is to be hoped an early interim

report will appear. It is clear that the new Parliament is confronted with a transport problem not exclusive to the publicly owned undertaking. The solution cannot easily be found and will be made more difficult if politics are allowed to intervene.

## Railwaymen's Plan for Transport

THE unilateral action of the National Union of Railwaymen in issuing a statement on transport policy a few days before the General Election was surprising in view of the Labour Party's reticence in its election manifesto. This, in its references to transport, apart from repeating the pledge to re-nationalise road haulage, was in very general terms. The explanation no doubt is that the Labour Party and the Trades Union Congress and the unions concerned with transport, after discussions stretching over many months, had failed to reach agreement, particularly in regard to the handling of the British Transport Commission's finances and the extent to which the ancillary user should be restricted, if at all. The N.U.R. statement therefore need not be taken as representing Labour transport policy, which, to the extent it is formulated, differs in important respects from the N.U.R. proposals. The latter would certainly not be acceptable to the unions concerned with the organisation of the road transport workers.

The integration and co-ordination of road and rail transport, which is the N.U.R. objective, is common ground, but the N.U.R. plan for achieving it is not. The main proposals are directed at attracting traffics back to the railways by the control and restriction of long-distance road haulage. This it would effect by re-nationalisation, by further restriction on the area of operations of "A" and "B" licences and by restriction on "C"-licence operations, by distance and the requirement of proof of need, subject to exemption of the lighter vehicles and certain traffics or types of operation.

The last is opposed by Mr. Frank Cousins's Transport & General Workers Union, and is understood to have proved a main obstacle to an agreed policy statement. The railwaymen's union is uncompromising and would be more restrictive than has previously been suggested. Its extent is shown by the proposal that some financial consideration would have to be given to existing owners of road vehicle fleets who were refused licences. Any arbitrary cutting off of current "C"-licence operations would be wasteful of existing assets and it seems more reasonable to confine proof of need initially to new entrants and on renewal of licences. This would facilitate a gradual run down of fleets and road carryings and allow more economic use of capital investment already made. It would also eliminate the necessity for compensation. In any case it is understood that the Labour Party is now more favourable to heavy taxation of "C" licences to equate costs and deter the growth of the ancillary user than to restriction on the comprehensive lines proposed by the N.U.R.

As to the further restriction of "A" and "B" licences, applicants already must declare the normal use of the vehicles. In effect the N.U.R. is merely proposing a tightening-up of the licensing system. The union does not seem to favour a monopoly of long-distance road haulage, for it states that there will remain a sector in which private haulage can work.

To enable the Commission to achieve financial equilibrium the main recommendation is that the B.T.C. be relieved of part of its interest charges. The N.U.R. instances the £28 million a year paid as interest on the original compensation stock and suggests that much of this is paid out on assets which no longer exist and should therefore be absorbed in the national debt. It is generally agreed that the accumulating indebtedness, which the present system of deficit financing is building up, will prove too great a burden for the Commission to carry even when modernisation is complete. In fact, the Chairman of the Commission, Sir Brian Robertson, has said as much. It is hard, however, to justify the segregation of compensation stock for special treatment. If the Commission is to pay its way, a capital reconstruction might be preferable. Presumed future earnings might be assessed and the capital burden of the B.T.C. scaled down to a level which it could bear. The Commission would then be required to pay its way and with this once-for-all State assistance the need for subsidies, with the accompanying lack of financial discipline, would be eliminated.

For the rest the N.U.R. proposes that interest-free loans be granted the Commission, and that it be restored full freedom to make economic charges. On the administrative side it is suggested that the Area Boards of the B. T. C. be replaced by functional boards of management. Part-time members are ruled out. The Labour Party has always been lukewarm towards the present boards but has given no definite indication as to what action it would take regarding them. A further proposal which is far from common ground is to transfer the road passenger industry to public ownership. Municipal undertakings, it is suggested, should not be acquired but would be brought into a working partnership with the Commission.

By publishing its plan the N.U.R. has served the useful purpose of bringing into the open the debate that had been going on behind closed doors. But by so doing it is hardly any more likely to get them accepted by Mr. Frank Cousins, who has so far opposed any measures which might create redundancy among his members, as these proposals might well do. In such circumstances it seems that, despite the action of the N.U.R., the Labour Party and T.U.C. are as far as ever from agreement on transport policy.

## Western Region Winter Passenger Services

THE chief interest of the British Railways, Western Region, winter timetable is in the service being provided from November 2 between Paddington and Birmingham and Wolverhampton to compensate for the withdrawal of all the expresses between Euston and Wolverhampton because of electrification work on the London Midland Region main line. There will now be an express from Paddington at every hour from 9.10 a.m. to 8.10 p.m., inclusive, and additional down trains at 8.30 a.m. and 6.23 p.m. In the up direction there will be departures from Birmingham Snow Hill (and from Wolverhampton about 25 min. earlier) at the even hours from 8 a.m. to 6 p.m., inclusive (except the 1 p.m., which will start at 12.45 p.m., as it will run to Banbury combined with the through Birkenhead-Bournemouth train), and at 7.30 a.m., 4.45 p.m., and 8 p.m. The 8.30 a.m. and 6.10 p.m. down will be non-stop to Birmingham, and the 4.45 p.m. from Snow Hill non-stop to Paddington.

Only the 8.30 a.m. down and the 2 p.m. and 4.45 p.m. up will cover the 110.6 miles between Paddington and Birmingham in 2 hr.; the average time for the whole of the 15 down and 14 up trains (in place of 9 down and 9 up as now) will be 2 hr. 16 min. This is disappointing, for it represents an average speed of only 48.8 m.p.h. As the purpose of the increased service is specifically to cater for passengers between London and Birmingham and Wolverhampton, it is surprising that so many of the additional trains call at Leamington, and some at Banbury also. Further, because of increased loading, the times of certain existing trains are increased. The 9 a.m. down "Inter-City," for example, is to be decelerated by 13 min. to Birmingham and Wolverhampton, and the 10.10 a.m. and 11.10 a.m. both by 11 min.

The intermediate stops at present made by the 6.10 p.m. down, now to be non-stop to Birmingham, will be assumed by the new 6.23 p.m. train. The new 2 hr. down service at 8.30 a.m. is an interesting experiment, and will be balanced by the 4.45 p.m. up 2 hr. non-stop relief to the 5 p.m. "Inter-City" from Birmingham. The up "Cambrian Coast Express" will leave Aberystwyth at 9.45 instead of 11.45 a.m., and will form the 2 p.m. instead of the 4 p.m. up from Birmingham, the only train to make a 2 hr. run inclusive of a Leamington stop. With the exception of the 3.10 and 8.10 p.m. down and 10 a.m. up, which will have buffet cars, every express will be provided with full restaurant accommodation, in which respect the Western Region service will be superior to that at present operated by the London Midland Region.

There is also to be a reorganisation of the express service from Paddington to Oxford, Worcester, Malvern and Hereford. In place of the present 9.45 and 11.45 a.m. and 1.45 p.m. trains from Paddington, departures will be at 9.15 and 10.45 a.m., 12.45 and 2.45 p.m. The last-mentioned becomes the "Cathedrals Express," in place of the 4.45 p.m. down. In the up direction, instead of 9 a.m. and 12.20, 2, 4 and 6.18 p.m. departures from Worcester to Paddington there will be trains at 8.55 and 10.55 a.m. (the latter the "Cathedrals Express"), and 12.55, 2.55, 4.55 and 6.55 p.m.

Overall times between Paddington and Worcester will range

from 2½ to 2¾ hr., and between Paddington and Hereford between 3½ hr. and 3 hr. 50 min. Although the new service is to be considerably more ample than in former years, as regards speed it should be recalled that in 1914 the 4.45 p.m. from Paddington reached Worcester non-stop in 2 hr. 9 min., and that the 8.55 a.m. up made the journey in 2¼ hr., including the Oxford stop. Oxford, incidentally, will benefit from the new Worcester service rearrangement, now having three down and six up non-stop trains from and to Paddington, three more in all than at present, with an average journey time of 68½ min. The 7.30 a.m. from Swansea (9 a.m. from Cardiff) to Paddington, and the 2.55 p.m. from Paddington to Swansea, introduced experimentally in the middle of the summer, have earned sufficient patronage to be continued through the winter. Buffet cars will be run in three trains in each direction daily between Birmingham, Worcester, Hereford and South Wales, and in those via Stratford-on-Avon.

As mentioned in the review of the Southern Region winter timetable in our October 2 issue, the 6 p.m. from Paddington and the 4.15 (now 4.5 p.m.) from Weymouth will no longer include a Channel Islands boat portion to and from Weymouth Quay. The boat trains will run from and to Waterloo. Until May 2, also, the daily through train between Birkenhead and the Kent and Sussex coast resorts is suspended.

## Signalling for 50-cycle Electric Traction

THE decision to adopt the 50-cycle system for electrification of British Railways has made it essential to consider what interference is liable to be experienced in the various signalling and associated circuits. This is necessary not only as regards the reliability of the signalling operations or clarity of telephone messages, but also to protect from shock, electrical or acoustic, the men using or maintaining the equipment.

Such problems were encountered with the first installations of high-voltage a.c. traction, of which the Morecambe-Heysham line of the former Midland Railway and the London suburban lines of the London Brighton & South Coast Railway were early examples. Various protective measures were taken, which proved reasonably effective in prevailing conditions, and the same situation obtained in those Continental countries which adopted a.c. traction. In the U.S.A. also, where two important railways applied such working, similar difficulties were overcome. On many of these lines, and certainly on the Continent, there was then little or no track circuiting and it became merely a matter of protecting the ordinary manual block signalling and telecommunications system from harmful effects. For this some research and practical experiment proved necessary.

All track circuiting originally had been of the d.c. type fed from batteries. It gave satisfactory results until the spread of electric tramways created a risk of stray current interference. This was less serious in Great Britain than in some other countries because of the stringent voltage return drop regulations imposed by the Board of Trade to meet the danger of electrolysis. The application of track circuits to electric railways, mostly worked by d.c., brought new problems, solved at first by an ingenious adaptation of polarised relays which enabled the London underground lines to be signalled automatically on electrification. Soon afterwards the use of a.c. for track circuiting gave the signal engineer an even surer means of immunising his equipment against dangerous stray current effects. On the L.B.S.C.R. lines worked by a.c., single-rail battery-fed track circuits combined with some simple protective measures were found to function reliably. That system of traction was abandoned soon after the amalgamation of the L.B.S.C.R. with the L.S.W.R. and S.E.C.R. to form the Southern Railway. By use of a frequency markedly different from that of the traction supply, track circuiting became applied extensively to a.c. operated railways, but for a long time the traction frequency seldom exceeded 25 and usually was less. The use of 50 cycles, particularly developed since the last war to work directly from main grid supplies, with a contact wire voltage approaching double that usually employed hitherto, brought further difficulties of its own. Much thought and many experiments were needed to overcome them, and large sums have been expended in cabling, providing screening devices, booster transformers and so on and designing new track circuit apparatus.

A great deal of this work was done initially in France. There special attention was paid to adapting electronic equipment to track circuiting, partly in attempts to overcome the troubles experienced with lightweight railcars, or where it was difficult to maintain a clean rail surface, as related in our issue of March 11, 1955. In Great Britain both the railways and the signalling industry, although they have followed developments elsewhere, have deemed it advisable to conduct their own investigations and design equipment adapted to provide the required reliability and freedom from objectionable interference. Many test measurements were taken and trials conducted with devices, as, for example, in the Eastern Region near London.

The extent and character of this work, the results of which appear in the apparatus now in service on the Eastern Region, Colchester-Clacton and London Midland Crew-Manchester lines, were shown by the paper read before the Institution of Railway Signal Engineers in London last Wednesday by Mr. W. S. Sweetenham, of the Westinghouse Brake & Signal Co. Ltd. After stating the principal considerations involved, the author described several methods by which they could be complied with in varying conditions and a satisfactory degree of track circuit reliability obtained. Some of the methods illustrated for immunising d.c. apparatus against a.c. current bear a certain resemblance to devices tried on the old L.B.S.C.R. overhead electrification, but it is clear now that some of the risks associated with them were insufficiently realised at the time.

The vital necessity of adhering to the closed-circuit principle in everything of this kind, rightly stressed by Mr. Sweetenham, creates difficulties for the signal engineer which are felt to a lesser extent in other branches of engineering. New problems have arisen in converting a fully-signalled d.c. electrified line to the a.c. system. These also call for considerable thought and experiment to produce equipment which can be changed over very simply in a brief interval without risk of mishap.

## The Denver & Rio Grande Western Railroad

*(By a correspondent)*

THE Rio Grande is the short name for an efficient railroad operating 2,155 miles of road in the States of Colorado and Utah. Its slogan is " Main Line thru the Rockies " and the Passenger Manager tells the American people that, wherever they travel in these wonderlands, they will enjoy a fairyland treat. Last year 498,645 passengers responded to the call, travelling on an average 246 miles at a fare of $5.9. The Rio Grande expects to carry many more people this year as Colorado is celebrating the centennial of the " Rush to the Rockies " when gold was discovered in 1859, but it runs passenger trains on only half of its mileage and its passenger revenue of less than $3 million was dwarfed by a freight revenue of $71 million in 1958.

Yet the Rio Grande passenger timetable, set out in a folder of 18 pages, has unique features. Ten years ago the railroad took a share in running the " California Zephyr," equipped with 5 vistadome coaches, between Chicago and San Francisco. After a journey of 1,039 miles from Chicago, the Burlington hands the streamliner over to the Rio Grande, at Denver, the capital of Colorado, standing a mile above sea level. Fifty miles on, the train passes through the 6 mile long Moffat Tunnel at a height of 9,239 ft., the topmost point on its 570 mile route to Salt Lake City, where it passes on to Western Pacific rails at a height of 4,233 ft. All seats on the train are assigned in advance and over 10 years 86 per cent of them have been occupied. So the " California Zephyr" is thought to be America's most popular transcontinental train, largely because it gives passengers fine views of the Rockies and the Colorado River, which its track parallels for 235 miles.

Rio Grande timetables give the elevation of each station, as well as the distance from Denver. A passenger can see at a glance that when he reaches Soldier Summit in Utah he has come 476 miles from Denver and is 7,440 ft. above sea level. For a stiff climb the Royal Gorge route, which sweeps round by Pueblo and the south side of Peak's Pike, the highest of the Rockies, takes the palm. At Royal Gorge, on the Upper Arkansas river, the timetable allows a " ten minutes stop to

view America's best loved travel wonder. Here is located Hanging Bridge, suspended between sheer canyon walls, just 30 ft. apart. Above may be seen the World's Highest Bridge, across the Royal Gorge, 1,053 ft. above the railroad tracks." When the train moves on for 115 miles uphill, it crosses the Continental Divide at Tennessee Pass, at a height of 10,221 ft., the highest point reached by a mainline U.S.A. railroad. The next 97 miles of this route are downhill to join the mainline at Glenwood Springs at the modest height of 5,758 ft.

In this difficult territory, the Rio Grande moved last year an average freight train load of 3,415 gross tons, or 1,629 net tons, at a speed of nearly 20 miles an hour and produced 67,817 gross ton miles in a train hour. These are all-time records and justify the railroad's decision to trust to the capabilities of 254 diesel electric units. Without the new motive power it could not have achieved an operating ratio of 65.2 per cent last year, compared with the ratio of 79 per cent for all the U.S.A. railroads.

The Rio Grande is now reaping the benefit of expenditures since 1947 amounting to $21 million on way and structures and to about $78 million on equipment. Its property is in first-class order. Over the last 12 years its train load has risen 78 per cent, while train speed became nearly 20 per cent faster and the output of freight train operation was more than doubled. These results have strengthened its position as a bridge carrier between the eastern and western railroads of America. It hopes also to profit by taking part in quickening freight schedules between the Midwest and the Pacific coast.

The Rio Grande has a pleasing custom of illustrating its annual reports with views of passenger and goods trains wending their way through the Rockies, sometimes alongside picturesque streams and always with massive mountains as a background. For example, last year's report showed a freight train coming down with a load of 3,313 tons gross from Granby, where the elevation is 7,900 ft., on a westbound run. Hauled by a 6,000 h.p. 4-unit diesel locomotive, the train of 77 loaded and 12 empty wagons went steadily along, overlooked by the jagged peaks of the Continental Divide. It is a specimen of the freight trains that helped the railroad to earn $10.4 million net last year, representing $4.95 per share of common stock. A remarkable performance for a railroad operating for the most part in territory well over the summit of Ben Nevis!

# LETTERS TO THE EDITOR

(*The Editor is not responsible for opinions of Correspondents*)

## Bus and Train Travel

October 9

SIR,—I refer to the editorial note in your September 25 issue. My recent experience shows what can happen at a mainline station which formerly served a branch line.

Alighting at Skipton from a London train on a Saturday afternoon, I found no bus to Grassington from the station front. I was told that a bus ran from the bus station, quarter-of-a-mile away. A fellow passenger with wife, two small children, two suitcases, and a folding push-chair, received similar information with a marked lack of enthusiasm.

I helped them with luggage over the "quarter-mile." We queued behind 30 other people for 50 min. for a bus which left packed to capacity. I stood for 10 miles. The children sat on the suitcases.

Yours faithfully,

F. A. BEAN

Mount Pleasant, Gossoms End, Berkhamsted

October 11

SIR,—The *Indicateur Chaix*, the French official timetable, contains a notice to passengers: "If your journey ends with travel in a bus connecting with the S.N.C.F., remember that your departure station will be able in most cases to issue a ticket and to register your luggage through to destination. Ask for particulars." The *Indicateur Chaix* also gives information on more than 3,500 road services connecting with trains.

Yours faithfully,

R. G. R. CALVERT

45, Woodwaye, Oxhey, Watford

## The Former G.C.R. Main Line

October 4

SIR,—I agree with Mr. D. J. Worrall, who states in your October 2 issue that a new station at Loughborough, where the former Midland and Great Central lines cross, would not help travellers very much. The junction between these two lines was the point of the scheme, and the new station an incidental. Nottingham Victoria is a major asset. It was built in the expectation of a large local traffic. The motorbus has taken this traffic away. Now the proposed Marylebone-Nottingham service will further reduce the use made of this asset. I suggest the point has been reached where the alternatives are to concentrate all traffic at Victoria, discarding the lesser asset of the poorly situated Nottingham Midland Station, or to close completely the line through Victoria and realise the value of the site. If Victoria is to be retained, money must be spent so that it is used fully.

The "new" station at Loughborough would not be less convenient than the present Midland station. It would occupy a position on the east side of the A60 Nottingham road similar to that of the present station on the west side.

I do not know Chesterfield Central Station, and was interested to hear of its short platforms. Mr. Worrall's scheme would not, as I see it, avoid the gradient to Holmewood Colliery. It would take extra traffic through the Midland Station, which already poses a major operating problem and would be difficult to enlarge. The route proposed to Sheffield Victoria would have the disadvantage of passing Staveley at a distance.

The Codnor Park Junction mentioned by Mr. R. Calvert in your October 2 issue would avoid the Holmewood climb, but not the other difficulties. All the fast traffic out of Nottingham Victoria would have to cross the Midland slow tracks on the level, unless a fly-over were built.

Yours faithfully,

D. J. MANTON

Cotswold, Evelyn Way, Stoke D'Abernon, Surrey

## Widening of the L.T.E. Metropolitan Line

October 10

SIR,—I note the reply in your October 2 issue from Mr. R. M. Robbins, Chief Public Relations Officer, London Transport Executive.

Mr. Robbins ignores the fact that the St. Lawrence Seaway was not "a completely new civil engineering work," as he terms it. May I refer to the authoritative description in "The St. Lawrence Seaway," by Lionel Chevrier, who was President of the Sea Authority in Canada?

Much of the widening of the Metropolitan Line between Harrow and Amersham can be carried out without possession of the adjoining tracks, as was done during the work on this section before the war, and is now being done on the East Coast main line of British Railways,

Yours faithfully,

W. LOCH KIDSTON

6, Chester Street, Edinburgh, 3

## London – Birmingham Passenger Services

October 9

SIR,—The electrification programme may necessitate concentration of the London-Birmingham expresses on the Western Region route, with a reduced service to Coventry, but this is an unfortunate time for such a step, for it almost co-incides with the opening of the London-Birmingham motorway, a serious competitor with the railway.

Even although it might involve costly alterations at Leamington, could not Euston-Birmingham expresses be diverted via the Leamington and Coventry line?

Yours faithfully,

J. B. LATHAM

Channings, Kettlewell Hill, Woking

# THE SCRAP HEAP

### Regular Travellers Complain (1899)

A meeting is to be held in Woking "to consider the question of the great loss and grave inconvenience caused to the residents on the main lines of the London and South-Western Railway Company by the gross unpunctuality of the train service." A little less devotion to race meetings and excursions and a little more attention to the requirements of regular travellers would remove the necessity for these demonstrations, which are not creditable to a great company like the South-Western.—*From "The Financial Times" of July* 29, 1899.

### Port of Manchester Campaign in Midlands

Third port of Britain in the volume of cargo handled in a year, Manchester, through which a considerable amount of traffic already passes from and to the Midlands, last week began a drive in that area to secure further traffic. Representatives of the Port of Manchester, with headquarters in the Grand Hotel, Birmingham, are calling on many firms during October. No other British port is believed to have organised a campaign for traffic on this scale, supported by extensive Press advertising. The team is functioning like election canvassers, with motorcars bearing labels giving details of the campaign.

### Railway Heraldry

We know of no authentic record as to when the first heraldic emblem was fixed to a railway locomotive, but a County Down correspondent states that the old Ulster Railway had a coat of arms fixed to its engine in October, 1840. The idea of adding the pomp of heraldry to this railway train was conceived by Dean Stannus, one of the Board of Management, and John Goodwin, the engineer, designed the badge which consisted of the bloody red hand of O'Neill centred on a red cross emblazoned on a white field. This shield measured 18 in. by 14 in. and was painted on oak, the wood being 2 in. thick. This was fixed with iron stays to the soot door of the locomotive, glass washers being inserted between the shield and the stays to insulate the heat. When Queen Victoria paid a visit to the Ulster Railway station in Great Victoria Street, Belfast, in 1849, the royal arms were sported by the locomotive she inspected. These were draped in green with gold streamers.

A full display of the royal arms with flags was seen on the royal train of the Belfast & Co. Down Railway in September, 1897, depicted in the accompanying illustration. Recently, at a sale of Great Northern Railway locomotives, two boys aged 14 and 15, hearing the bids, approached the buyers and arranged with them to give them the coats of arms of the Company when the engines were broken up.

### Apologies for Early Arrival

Early arrivals of expresses can have strange results. Because of possible traffic delays on Saturdays and of civil engineering work on the main line in connection with electrification, the Saturday schedule of the "Red Rose" of British Railways, London Midland Region, allows 4 hr. 5 min. non-stop from Euston to Liverpool Lime Street. On October 3, the train, hauled by a diesel locomotive, was 44 min. ahead of time on the approach lines to Lime Street. It was then held for 17 min. whilst a platform road was cleared, but still arrived 27 min. early. A passenger complained at the stationmaster's office of the 17-min. delay and received an apology from the astonished office staff.

### Small and Efficient

The Magma Arizona Railroad, a small undertaking in Western U.S.A., is still fully steam-operated. It operates under Inter-state Commerce Commission regulations, and the permanent way consists of good rock ballast, although with 70-lb. rail. The line connects with copper-mining and smelting centre of Superior with the Southern Pacific Christmas branch line at Magma. The net receipts in recent years of $20, $29, and $40 have been hailed as cause for deep satisfaction. The motive power includes Baldwin-built No. 6, acquired from the El Paso & Southwestern; No. 5, bought new from the American Locomotion Company in 1923; and No. 7, also a Baldwin, obtained from a Louisiana logging line in 1953, and held in reserve for peak traffics. The magazine *Arizona Highways*, which this year published a full-length illustrated article on the 28-mile railway, assured its readers that "all three locomotives shine with copper paint on their smoke boxes."

### Good Value for £6

British Railways has sent a letter to Mr. Ernest Harmer of Watnall, Nottingham, congratulating him on travelling over 2,500 miles in the Eastern Region, using a Rail Rover Ticket. This gave him unlimited travel in the Region for a week for only £6, or a little over one-halfpenny a mile. He visited many lesser-used lines in Eastern England from the Humber to the Thames and sampled all the forms of motive power now in use. Mr. Harmer has stated that not one connecting service was missed on his tour. Trains generally ran to time and many arrived early.

### Centennial Exhibition in New Zealand

A highlight of the South Canterbury centennial rail, sea, and air transportation exhibition was a train drawn along the three-mile route from Washdyke to a specially-erected railway station at the Port of Timaru by New Zealand's oldest locomotive, the Class "F" Peveril built in 1872. On the train were centennial mail, pioneer passengers, and a large official party. More than 100 people travelled in the two bench-seat clerestory-roofed carriages which first saw service in the 1890s. The postal van on the train was the first railway travelling post office to operate in the South Island for 17 years.

### "Bus Trains"

The possibilities of "bus trains" are being examined by the Chicago Transit Authority. The vehicles, it is suggested, would run on special roadways in the centres of super-highways and separated from normal road traffic by grass verge-strips. Speed regulation, steering, and braking control would be effected by a magnetic flux picked up by a sensing apparatus on the vehicle from a guide wire embedded in the centre of each traffic lane. The idea is based on principles similar to those of the Guide-O-Matic system, used for controlling driverless trains of tractors and trucks moving materials in some industrial concerns with considerable efficiency.

*Royal train of the former Belfast & Co. Down Railway, in September,* 1897, *showing display of royal arms and flags*

### Branch Line

You've heard the last wild whistling
Echo along the down,
That long-familiar warning
Of the eight ten to Town—
For now they've closed our branch line
And the green tide's begun
To creep across the railway,
And make a secret run
For hedgehogs, hares and field mice,
Until the shining rails
Will be as men forgotten
As those green lonely trails
Where packhorses once plodded
High on the dreaming down,
Long years before our proud eight ten
First whistled through to Town.

G. B. BERRY, in *The Field*

XUM

# OVERSEAS RAILWAY AFFAIRS

*(From our correspondents)*

## INDIA

### Heavy Mineral Trains

The South Eastern Railway is now working 3,400-ton mineral trains to carry raw materials to the various steelworks. Trials are also be carried out for running 5,000-ton trains worked by three diesel units and two brake-vans connected with walkie-talkie telephone sets. The movement of these raw materials is double what it was last year mainly due to the operation of the new Rourkela and Bhillai steelworks. The Eastern Railway also is operating greatly increased trainloads with diesel traction.

### N.E.R. Main Line Doubling

The metre-gauge main line of the North Eastern Railway between Barauni —at the north end of the Mokameh Ganges Bridge—and Katihar, 110 miles, carries a heavy and rapidly-increasing traffic expected to require 18 or 19 trains each way daily within the next year or two. Its central 48½ mile section between Khagaria and Katareah has, therefore, just been doubled at a cost of some Rs. 205 lakhs (over £1,500,000). This line carries all the Calcutta-Assam traffic and much shorter-distance traffic also.

### Allahabad Station Remodelling

The work of remodelling Allahabad Station, an undertaking estimated to cost Rs. 40 lakhs (£300,000) and taking four years to complete under traffic, has been designed to cater for a normal daily number of passengers of 15,000, but during festival periods several hundred thousands pass through this station each day. There is also a heavy goods traffic. The old station has been entirely demolished and replaced, and the work is now nearing completion.

## CHINA

### Trunk Line Construction

In North-West China, the 700-mile line from Lanchow to Paotou, the steel centre, which twice crosses the upper part of the Yellow River, is now complete and in operation. The western trunk line which is intended to link the Chinese railways with the Turk-Sib Railway via Urumchi and the Sino-Soviet border at Alma-Ata, has now reached the neighbourhood of Hami, about 400 miles from Urumchi and nearly 2,000 miles from the seacoast.

In Central China a new line is under construction from the Lunghai section of the western line to Itu, an iron and steel centre in Western Hupeh. It will be 410 miles in length and is intended primarily for the transport of coal to Itu.

Before the war with Japan, a railway was built southwards from Nanking, financed by British Indemnity Funds. During the Japanese invasion the track was removed to provide material for railways in Free China. This railway is now being restored and will link up at its southern end with the Shanghai-Canton main line.

In South-West China a line running westwards from the Canton-Hankow section of the Peking-Canton Railway is being extended about 300 miles to Kweiyang, the capital of Kweichow Province. Construction has also begun on a 300-mile line westwards from Kweiyang to Kunming (Yunnan). These lines when completed will form a new trunk line to the extreme south-west of China, near the Burma frontier. A railway has been completed from Lanchow to Sining, 150 miles west. This is the first stage of a railway to Lhasa, and the remainder has been surveyed.

## CEYLON

### Curtailment of Indo-Ceylon Service

Because of a decline in rail traffic between India and Ceylon, it was decided to curtail the services as from October 1, 1959. With this decision the Indo-Ceylon ferry services between Dhanushkodi (India) and Talaimannar Pier (Ceylon) is now confined to three times a week each way. Consequently the up and down night mail trains operating between Talaimannar Pier and Colombo run only on Tuesdays, Thursdays, and Saturdays.

Because passenger accommodation is limited to 400 on the ferry boat, only 200 upper class and 200 lower class passengers are being booked for each train. Local services between Madawachchi and Talaimannar are provided on the days the mail trains do not run.

## WESTERN AUSTRALIA

### Record Grain Traffic

Up to June 30, 1959, over 250,000 tons more grain was carried by rail in Western Australia than in the previous year. The Railway Department carried 1,117,909 tons of wheat, oats and barley in 1958-59 as against 877,341 tons for the previous year. The current year's record harvest is being carried successfully and for the first two weeks of the 1959-60 financial year approximately 79,000 tons of grain was railed. Special trains have been and are being run as required and there has been no difficulty in clearing all grain loaded. More than 500,000 tons of this season's grain still remains to be moved to the coast.

### Improvements to Port Facilities

Increased port traffic, including record shipments of wheat, have called for extensive improvements for the handling facilities of rail traffic to the port of Fremantle. Work is well in hand on the first stage of these improvements, that of the construction of a railway marshalling yard for the Fremantle Harbour Trust at Leighton.

The entire plan includes an interchange siding branching off the main line at Cottesloe and feeding into two marshalling yards, one for normal railway traffic for the Fremantle area, and the one now under construction for the Harbour Trust. Track will comprise 60-lb. welded rail. The entrance and departure of traffic through the interchange siding will be controlled from an enlarged 60-lever signal cabin at Cottesloe. Colour-light automatic signalling will be installed on the siding. The yard at Cottesloe also will be extended.

Arrival traffic on to the siding will run into one of four arrival roads from where it will be marshalled over a hump into either the railway marshalling yard or the Harbour Trust marshalling yard. Diesel locomotives of the Fremantle Harbour Trust will handle all port traffic such as to and from the grain silos and the North Wharf.

This scheme will permit proper interchange of traffic between the W.A.G.R. and Port Authorities and will enable direct deliveries of grains and oils. It will effect considerable economies in time and expenditure. The cost of the work will be shared by the Fremantle Harbour Trust and the Railway Department. The initial cost of the first stage was £40,000 and the estimated total cost of the completed work is £235,000.

## ARGENTINA

### Rehabilitation Plan

The Argentine Government has drafted a plan to rehabilitate the country's rail transport system, the execution of which will be spread over 10 to 15 years at an estimated cost of some 150,000 million pesos (some £640 million). The plan is reported to include important organisational reforms with a view eventually to eliminating the present heavy operating deficit, estimated in the current year at nearly 12,000 million pesos, or some £50 million.

## BRAZIL

### Railway Accidents

A parliamentary commission is investigating the causes of recent accidents on the Central Railway suburban lines at Rio and Sao Paulo. Dr. Jorge Abreu Schilling, Director, Central Railway, has stated that the cause of the majority of accidents, as revealed by the enquiries, were due to material defects, fortuitous circumstances, and functional failures. The working conditions of those responsible for moving trains are being improved, signalling systems modernised, C.T.C. installed, permanent ways reformed, and aerial networks remodelled.

The company's suburban passenger traffic has grown from 32,542,189 passengers in 1937 to 169,676,895 in 1958. It has 151 electric trains in circulation, but requires at least 200; these will be available within the next few months. During the past two years over 500 trains of six coaches each have been formed daily; 20 trains have been circulating hourly throughout peak periods and the number is now being

raised to 30, with nine coaches instead of six. Suburban passages cost 2 cruzeiros (about three halfpence) for distances up to 70 kilometres, causing a loss of 475,169,641 crs. in 1958.

Improvements about to be carried out include separating suburban passenger and freight services and unification of the Central and Leopoldina suburbs when the gauge of the latter's tracks to Duque de Caxias has been widened.

### Electrification Progress

The Central Brazil Railway has started electrifying its suburban lines at Belo Horizonte, capital of Minas Gerais; 23 three-car train units are scheduled to begin running in 1960.

## FRANCE

### Type "040DG" Diesel Locomotives

The French National Railways has received delivery of the first of a series of 40 diesel-electric 1,400 h.p. locomotives of the 040DG type, ordered in 1957 and 1958 from Alsthom. These new locomotives are designed to haul both goods and passenger trains. They are equipped with two bogies and the single "V" type 16-cylinder diesel motor drives an electric generator which, in turn, supplies current to four electric traction motors (one to each axle). There is only one control cabin. These locomotives can be coupled together in pairs to haul heavy trains and be driven as one unit by the same driver. The engine compartment is sound-proofed to reduce noise. These locomotives weigh 72 *tonnes* and have a maximum speed of 65 m.p.h.

The introduction of these 1,400-h.p. locomotives fills a gap in the power range of S.N.C.F. diesel engines. The majority of those in use at the moment do not develop more than 825 h.p. They are used for shunting purposes or for services on low traffic lines. There are, however, over 50 locomotives with a fairly high power rating (2,000 and 1,800 h.p., 060 DA and 060 DB class) which have been in service for some years on the Paris-Grande-Ceinture line and in the region of La Rochelle. Of medium power, the 040 DG engines will be widely used to help to eliminate steam traction on S.N.C.F. lines. The first of these locomotives will be put into service in the Toulouse-Capdenac area, and also in the Bresse and Jura regions.

*Type "040 DG" 1,400-h.p. diesel-electric locomotive built by Alsthom for the French National Railways*

### Shunting Test Equipment at Vitry

Additional equipment has recently been provided by the S.N.C.F. at the Vitry-sur-Seine Testing Depot for Shunting and Buffing, in accordance with a programme of work laid down by O.R.E. It includes a drop hammer to enable the intrinsic characteristics of each type of buffer to be determined by varying the weight of the falling mass from 2 to 4 *tonnes* and the height of the fall up to 5 ft. 2 in. A new test track is nearly 200 ft. long on a 1 in 8 gradient. This enables tests to be made with wagons at varying speeds with different obstacles.

### Market Development at Nîmes

A rail-served industrial and commercial centre is being built on a 55-acre site south-west of Nîmes. It will include a cattle market, slaughter-house, a 13,000 cu. yd. cold store, and a market depot for fruit and vegetables. All buildings are to be connected with the Nîmes-Toulouse line.

## Publications Received

*Weichenbautechnisches - Handbuch* (*Handbook for Points and Crossing Work*). Frankfort/Main : Dr. Arthur Tetzlaff Verlag. 5¾ in. × 4¼ in. 592 pp. Illustrated with diagrams and tables. Price DM. 12.—This book provides in diagrammatic and tabular form many items of dimensional information required by permanent way engineers. It is confined to German practice, but covers not only the latest forms of rail and so on, but many others still in use inherited from the former independent State railways in Germany. It could also prove useful to engineers in other countries who use similar designs.

*Optical and Lighting Equipment for Visual Inspection.*—A booklet issued by P. W. Allen & Company shows examples of the equipment and services available for visual inspection and observation. The equipment described includes work and inspection lights, special-purpose magnifiers and viewers, inside inspection instruments, and remote viewing instruments. Optical instruments known as endoscopes, consisting of a train of lenses and prisms held in rigid metal tubes, carry their own lighting and also can be used for photography. With these, fuel tanks and boilers can be inspected through openings as small as $\frac{5}{32}$ in. and at depths of up to 25 ft. The instruments are stated to be of rugged construction for workshop or site use. The portable fluorescent work lights are shown mounted on a base which allows for a wide range of adjustment for the lighting angle and shielding. The address of P. W. Allen & Company is 253, Liverpool Road, London, N.1.

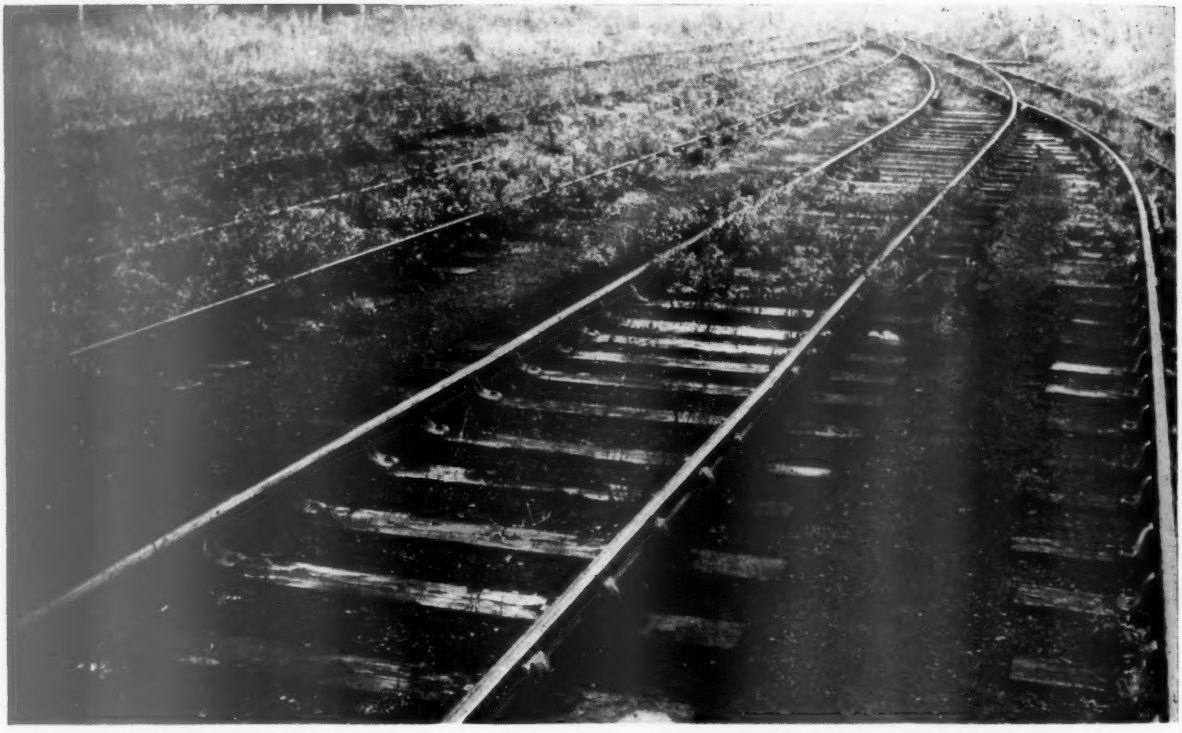
*Schweizerische Bundesbahnen — Statistisches Jahrbuch*, 1958 (*Swiss Federal Railways Statistical Annual*) (German and French text). Berne : Published by the Swiss Federal Railways. 11½ in. × 8¼ in. 132 pp.—Uniform in size with the ordinary annual business report, this collection of facts covers all aspects of the Swiss Federal Railways undertaking, especially traffic operation. It states, for example, the work performed at each station, and the amount of passenger and goods traffic carried over the various sections of line. Useful annual figures under various headings are from 1903. A supplement gives the results of the inquiry held in 1955 into the local traffic in the Zurich area, and another contains much useful information on rail and road traffic in other countries.

*Ficep Shearing Machines.*—Two new broadsheets illustrating the Ficep ranges of hand- and power-operated shears have been issued by Thos. W. Ward Limited, the sole distributor for these machines in the United Kingdom. The shears are shown arranged for shearing, punching, grapping and notching work and in capacities for dealing with up to 6⅞ in. sq. cold billet material of 32 tons tensile, or proportionately smaller sizes of the special steels now coming into common usage. They are equally suitable for the cutting of hot billets and bars in steel works, rolling mills, and forging shops. Copies may be obtained from Thos. W. Ward Limited, Albion Works, Sheffield.

# Progress in Railway Weed Control

*A review on recent research on weed-killing, with particular reference to railway sites*

*By Dr. G. S. Hartley,*
*Director of Research, Chesterford Park Research Station, Essex*



*Weed-infested tracks in Switzerland, showing section in foreground after treatment with simazin*

THE major objects of hard ballast are to provide a foundation not movable under the influences of fluctuating pressure, wind, rain, vegetation and burrowing animals.

For the latter roles, it relies primarily on providing an inhospitable terrain for infant plants. Rapid drainage permits little moisture to be retained except at depths where light is minimal. But some plants compensate a high infant mortality with enormous fecundity, their seeds needing only a millionth chance to secure survival of the species. Plant life will establish itself in anything from the neglected chimney stack to the forgotten rain-butt. The hard-ballast railway track is far from immune.

### Means of Clearance

The factors which make new-laid track inhospitable to plant life make its removal by mechanical means difficult and inefficient. On the track itself and in the cesses, " gardening " is still practised despite its cost. Fire is sometimes an uninvited ally in dry areas, but too easily gets out of control. There remains the method of chemical attack—the use of plant poisons or herbicides.

Although the earliest seedlings and creeping perennials attain no great size, they assist the collection of airborne dust and this, together with their dead remains, leads to rapid build-up over the years. Maintenance becomes increasingly difficult, and eventually there is obstruction of ancillary moving gear and friction-reducing contamination of the rails. Rigorous exclusion of weeds from the beginning is now a practical possibility with new chemicals.

On tracks subject to a relatively low standard of maintenance, the demand on the herbicide is high because of the greater growth potential of the less clean ballast. The greatest density of weeds occurs in cesses and toe of the shoulder. To deal with this, modern mechanical sprayers incorporate means of delivering a high dosage of chemical in these places.

This article gives a brief review of the use of herbicides on railways, chemicals used, and methods of application. Reference will be made to methods which have not been applied to any extent in this country, but the main emphasis will be on methods applicable under British conditions of climate, population density, and social and legal standards.

Because weed control on railway tracks is a world-wide requirement, the problem cannot be dealt with by one method in all areas. There is great variation in the relative importance of different factors—economic, climatic and biological. Availability of materials, including water; vigour of plant growth and speed and seasonality of its invasion; range of species of plants, not all best dealt with by the same chemicals; loss of chemical by leaching and wind erosion —all these factors influence our choice of method.

### No Standardisation in U.S.A.

In the U.S.A., where chemical control has had its longest and most advanced usage, different methods are adopted in different areas, and it is unlikely that uniformity will ever be reached. Only some of the American experience is applicable to our more limited climate and crowded conditions. Experience in Switzerland and Germany is more directly applicable.

Total herbicides of a rather crude type, applied in large dosages, have long been used on railway tracks. By comparison with other industrial sites—around fire-

vulnerable factories, oil stores and timber yards—the railway track is a better target for this weapon. It is accessible. Power and mechanical skill are available. Water, the cheapest convenient carrier of chemicals, is necessarily in supply for other purposes. The width to be treated is simply related to the number of tracks: awkward corners difficult of access are few and unimportant. The surface is regular and well drained so that the chemical-bearing water runs in and not off.

### Slow Development

Perhaps because the railways exercise a mechanical function of great complexity and responsibility, the early start in chemical methods of weed control has not kept up with recent developments which largely originated in agricultural work. Even the equipment for spraying is often rather primitive, a surprisingly large amount of the work being done by hand-operated, hand-propelled vehicles. Some aspects of mechanisation will be referred to later.

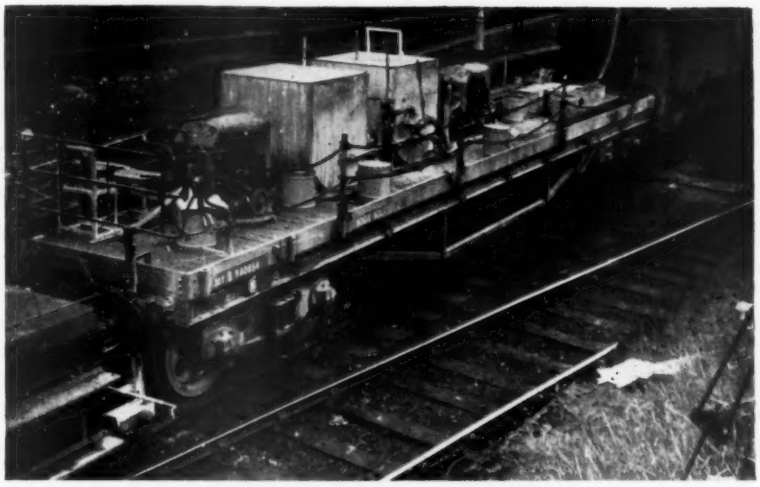
Until some 20 years ago, only four main types of chemical were in use, most extensively in the U.S.A. These were :—

(i) *Crude oils.* These are used in massive dosage (100 gal./acre or more). They are as much physically as chemically toxic, grossly interfering with the all-important outer structure of plant tissues. They are reasonably effective and, because of their viscous nature and low solubility in water, persistent. They are economic only near to cheap sources of supply. They can be strengthened in effect and, therefore, reduced in dosage by addition of more toxic oil-soluble components such as high phenolic distillates (creosote) or, better, dinitro cresol. Such are called " fortified " oils.

(ii) *Compounds of arsenic.* Although actually essential to life in trace quantities, all ordinary compounds of this element are toxic to all forms of life if present in excessive amount. Crude ores have been used, but are difficult to apply uniformly. Arsenic is effective in producing lasting sterility but is highly toxic to animals. Straying of animals and blowing of contaminated dust on adjacent land led to heavy stock losses in the U.S.A.

(iii) *Compounds of boron.* In particular, the soluble sodium tetraborate or " borax." Boron, like arsenic, is an essential trace element, universally toxic in excess. It has the great advantage that toxic level is much lower in plants than in animals. It is still widely used, often in admixture with other chemicals to give it a wider " spectrum " of species controlled. Borates are soluble and easily leached from the soil, so their effect is not very persistent.

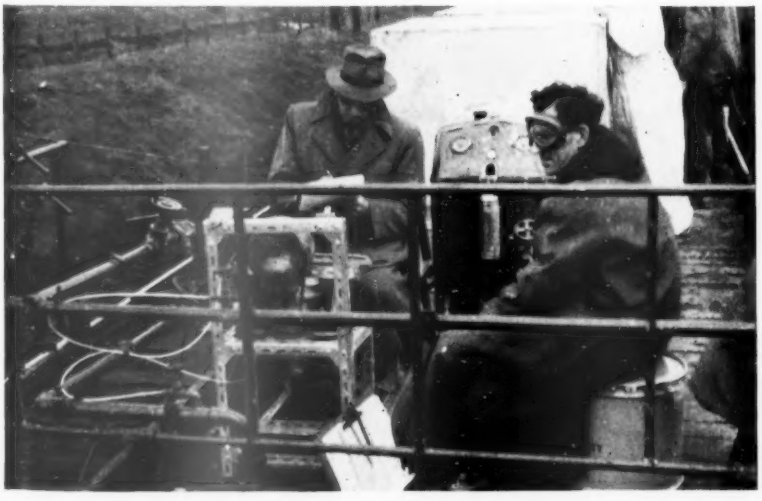
(iv) *Chlorates.* Generally, sodium chlorate is used. The compound is cheap, but high dosages (120-240 lb. per acre) are necessary. It is relatively harmless to animals but, being very soluble, it is rapidly leached out of the rooting zone in wet districts. It is, moreover, slowly reduced by organic matter in the soil to relatively harmless chloride, so that there is a chemical as well as physical source of loss. Chlorate, when dried in contact with organic matter, greatly increases the chances of ignition and the vigour of the resulting fire. Although almost universally " safetened " by addition of calcium chloride, it still increases fire risk. Chlorate has been the herbicide chiefly used on British Railways in the past.



*Weed-spraying equipment mounted on standard rail bogie*

In recent years many new and important organic chemical herbicides have been developed. The advance came during the war when two cheaply-produced chemicals, 2, 4-D and MCPA, proved effective against most species of plants when applied in dosages as low as 1 lb. per acre or less, while having little effect on grasses. In countries of high agricultural efficiency, the greater part of the acreage of young cereals is treated with these chemicals.

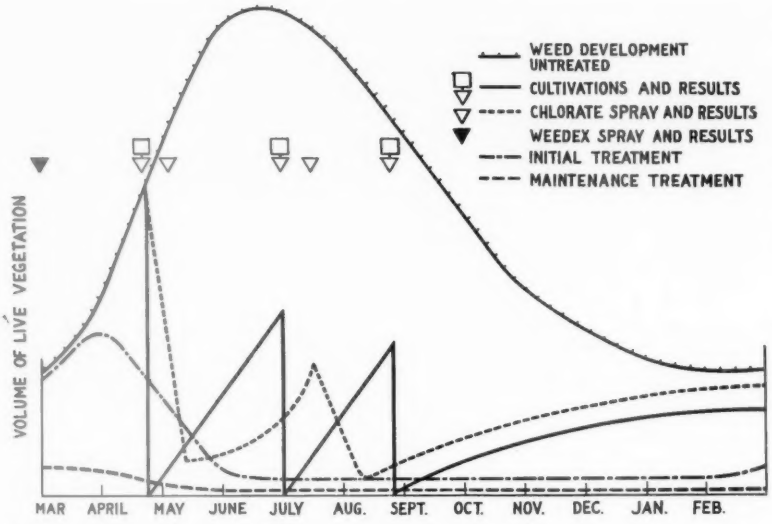
They have been used on railways in the U.S.A., usually in admixture with sodium trichloracetate or sodium dichlorpropionate (dalapon), compounds which are particularly lethal to the grasses which 2, 4-D and MCPA alone would leave to flourish. Their great disadvantage, a particular drawback in intensively-farmed Britain, is that they are easily taken up by foliage and have an insidious effect on the growth of many plants at dosage levels far below those necessary to produce a satisfactory kill, where this is our object. When sprayed on railway tracks there is often sufficient downwind drift of fine spray to produce serious damage to susceptible adjoining crops—kale, sugarbeet and, especially, tomatoes. Already liable for considerable compensation for fire damage, the railways are naturally not anxious to incur another debit.



*Control point of spray equipment*

### Solubility and Decomposition

British rainfall is higher than that over a large part of the U.S.A. and consequently the very soluble herbicides, borate and chlorate, are not adequately persistent. The same applies to 2, 4-D and MCPA which, in moist conditions, are fairly rapidly decomposed by soil micro-organisms. Even with modern, relatively fast-running equipment, spraying is expensive and a disturbance to normal traffic. Infrequent application of a herbicide having persistent effect


WEED DEVELOPMENT UNTREATED
CULTIVATIONS AND RESULTS
CHLORATE SPRAY AND RESULTS
WEEDEX SPRAY AND RESULTS
INITIAL TREATMENT
MAINTENANCE TREATMENT
VOLUME OF LIVE VEGETATION
MAR APRIL MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB.

*Graph showing results of spray treatments with Weedex (trade name of a simazin weed-killer)*

is therefore of the first importance.

The crowded agricultural and social conditions of Britain affect the problem in other ways. A higher standard of track maintenance is required and the drift danger is greater not only to agricultural crops but to populated property. With faster spray trains, accidental spraying over bridge parapets on crowded roads is by no means negligible. It is better that this should occur with harmless chemicals, such as those recommended later in this article.

The success in agriculture of 2, 4-D and MCPA has led to intensive research to find new selective killers. Many interesting compounds have resulted, two of which under large-scale trials have shown great potential as total herbicides when used in adequate dosage. Both have interesting selective action at lower dosages. These are monuron and simazin. Both have close chemical relatives which are also active. Further developments are therefore probable. These compounds have important advantages for railway use.

They attack plants mainly through the root system. This probably largely results from their very low solubility in water so that the action of the very extensive water-absorbing roots is necessary to bring enough chemical into the interior of the plant. Whatever the reason, the fact that there is little foliage-action results in negligible effect of unavoidable drift.

### Long-term Effect

The low solubility, combined with unusual resistance to bacterial attack, keeps the compounds effective in the rooting zone for a long time. Year-long effectiveness can be generally expected; sometimes longer. The very low solubility produces two disadvantages, which are comparatively unimportant. They are (*a*) that the physiological action of the compounds is slow, and (*b*) that they must be applied as suspensions, requiring agitation of the liquid to ensure even dosage.

With regard to their slow action, this is only a disadvantage, in proper use, while the staff responsible for weed control are acquiring experience and confidence. Once it is established by the workers' own experience that yearly sprayings with simazin will keep tracks substantially weed-free, it is not important that the few struggling invaders after last year's treatment should be seen to shrivel in the wake of the spray train.*

### Prevention, not Cure

The object on railway tracks is to preserve a desert, not destroy a jungle. The more quickly and cheaply and the less frequently the operation for the former object can be carried out, the less often will it be necessary to adopt special measures with the second object in mind. Both of these new compounds are chemically compatible with the other rapid but more transient herbicides so that the latter can be used to accelerate the effect if densely-weedy derelict track has to be attacked.

As the compounds are slow in action and operate mainly through the root, they must be made to penetrate to the rooting zone at the time required. Early sprayings, before prolonged dry weather, are clearly desirable. It may even be found preferable to spray in late autumn or during open weather in winter. This basic difference between the new preventive treatments and the old killers of established weeds is illustrated in the graph.

The advantage of long-period persistent action will not be fully realised if the ballast is subjected to mechanical disturbance after application. Where a persistent herbicide is used, " gardening " is unnecessary. It is to be hoped, although it is at present too early to assess whether the hope can be realised, that preservation of a clean track from the beginning by these persistent herbicides will reduce the frequency with which costly mechanical track cleaning must be carried out.

With regard to the disadvantage that these compounds must be used as suspensions, this does not seem a great obstacle. When one considers the complexity of efficient machinery necessary to carry huge loads of passengers and goods and the workshop and engineer resources which back up this service, the problem of stirring a liquid while spraying it can hardly be considered a difficult one.

### Prototype Sprayer

It has been the privilege of the agricultural research station that I serve to make, in its own workshop, applying its agricultural spraying knowledge, a prototype sprayer for the railways to deliver a regulated dosage of simazin powder suspended in water. This machine has already been described in this journal. It has sprayed at 20 m.p.h. delivering 80 gal. per acre and it would seem possible to improve on this, the problems to be overcome largely arising from use of an unspecifically-adapted means of locomotion. I look forward to the engineering of a streamlined durable unit.

The need for water is solely to carry the chemical conveniently and evenly to the track. It is not to wash in chemical. Even in the driest part of England, average daily rainfall is over 1,000 gal. per acre. It is evident, therefore, that we cannot possibly apply water to compete with one light shower. As we are using only a very low dosage of suspended chemical, the amount of water necessary is determined by spray-mechanics—enough to use sufficiently large drops to avoid serious unevenness resulting from wind-action without separating the drops to an extent which would interfere with even coverage.

Experience to date with both the new compounds referred to has shown us

*Track in Switzerland after treatment with simazin*

* No herbicide produces its full effect short of several days at best. The fortified oils produce extensive visible damage in a few hours.

*Details of prototype spray train. (Left) : instrument panel ; (centre) : control lever to match spray output to speed ; (right) : matched shoulder and cess cover at 22 m.p.h.*

that simazin is the more suitable for railway use. Weight for weight, it is rather more persistent than monuron, particularly when used on ash ballast which tends to " absorb " the chemicals, i.e., to hold them in a state of reduced activity. It is also easier to suspend and to see after spraying. Neither compound has been as successful in arid climates as in temperate ones. In part, this is because the material is not adequately washed down to the deep rooting zone and evaporation losses are greater in consequence of more surface exposure at higher temperature. There is slight indication of a similar tendency between the wetter and drier parts of this country. I have mentioned that the compounds have several active relatives. A more soluble relative of simazin, called atrazine, may well prove to have advantage over simazin in drier eastern districts of Britain.

### Chlorates and Conductivity

Modern railways make increasing use of electrical signalling and communication equipment. Chlorate solutions in water are inevitably highly conducting. They can cause direct trouble as a result of shorting and, as their action is corrosive on metals, indirect mechanical and electrical troubles. Their use on electrically-operated railways with conductor rails is even more undesirable. Even borates, though much less corrosive, have undesirable electrical conductivity. These factors increase the advantages of monuron and simazin. Suspensions of these insoluble non-electrolytes in water contribute less to the conductivity of the water than the impurities normally present in ordinary sources of supply.

There is ample evidence to support the view that a spray programme, technically sound in regard to choice of chemical and means of application, could give a much higher standard of weed control across the whole section of the track than has been hitherto possible. The treatment will replace the present use of non-persistent herbicides and will dispense with the aid of manual methods, the practice of which is antagonistic to the effectiveness of a persistent herbicide. The final result will be the maintenance of a cleaner track at lower cost.

*Track at Springhead Goods Depot, North Eastern Region, British Railways. Left—treated ; right—untreated*

# Traffic Manager's Office at Doncaster, Eastern Region

*Five-storey block on mass concrete piers sited to conform with layout necessitated by future ring road*

*View from south-west, showing plinth allowing for adjustments in level of roadway, also aggregate in-fill panels above first floor*

WHEN the Eastern Region of British Railways introduced its new traffic organisation in 1957, the Doncaster Traffic Area was formed as one of the four areas under the Line Traffic Manager (Great Northern), Mr. G. F. Fiennes. The staff of Mr. E. J. Stephens, Traffic Manager, Doncaster, was dispersed in separate buildings. To realise the full benefits of the re-organisation it was necessary for the staff to be a compact unit under one roof. No suitable existing accommodation was available.

The five-storey block has been named Gresley House, after the late Sir Nigel Gresley, Chief Mechanical Engineer of the former Great Northern and London & North Eastern Railways. It was opened on October 2 by the Mayor of Doncaster, Alderman F. Ogden.

It stands on the north-east side of the forecourt of Doncaster Station on a site chosen in relation to the proposed new ring road which will pass through the oldest part of Doncaster. As the road will affect the design of the forecourt, the offices have been sited to conform with the future layout.

The building contains 19,500 sq. ft. of office space. Internally the offices are divided by demountable glazed partitions. Floors generally are in grey thermoplastic tiles with polished hardwood strip flooring to the entrance hall and concrete tiles in lavatories. Ceilings throughout are in impregnated acoustic insulation board, painted pale blue.

A feature of the entrance hall is a plastic photo-mural in black and white, 10 ft. x 10 ft., based on a photograph of a marshalling yard at night. Part of the entrance hall is devoted to an inquiry desk and a waiting area for public visitors.

The block is founded on mass concrete piers about 15 ft. deep, to avoid extra pressure being exerted on an old brick sewer running alongside the site. A boiler room, fuel store and telephone apparatus rooms are suspended between these foundation blocks to form a basement. The ground floor is raised some 3 ft. above the general level of the ground. The plinth allows permanent ventilation to be provided to the basement and for minor adjustments in the final level of the proposed ring road.

### Pre-cast Concrete Units

Construction up to first-floor level is in *in-situ* reinforced concrete with exposed aggregate pre-cast concrete slabs used as a permanent shuttering to the outer face of the first-floor slab. Above the first floor, the building consists of four storeys of Intergrid pre-cast concrete post-tensioned units, with exposed aggregate in-fill panels between columns and Utile hardwood pivoted windows.

The main staircase has a central reinforced concrete carriage with hardwood cantilevered treads from ground to first floor, and is of standard Intergrid staircase construction above.

The roof structures (tank room and lift motor room) are of corrugated aluminium sheeting on softwood structural panels with ¼-in. of insulating asbestos sheeting internally.

An external spiral fire escape staircase at the north end of the building is made up of specially-designed pre-cast post-tensioned units.

Gresley House was designed under the general direction of Mr. A. K. Terris, Chief Civil Engineer, Eastern Region, by Mr. H. H. Powell, Regional Architect.

The main contractor was Frank Haslam Limited of Doncaster.

*Office on first floor, and demountable partition*

# L.M. Region Mobile Signalling School

*Instruction in new apparatus introduced on re-signalling main lines includes tracing and correction of faults*

*Trainees receiving instruction on a signalbox shelf. Instruments are divided into three categories representative of equipment in three types of box*

TO obtain the full benefits of electrification, the main lines of British Railways, London Midland Region, between Euston, Manchester and Liverpool are being completely re-signalled. Colour-light signalling is to replace the existing semaphore signalling, and the lines will be continuously track circuited and equipped with automatic warning control. Fifty-six new signalboxes, of which nine will be power-operated, are to be provided, enabling over 120 existing mechanical boxes to be dispensed with. This involves a considerable increase of planning, installation, and maintenance staff and a corresponding increase in training facilities for new recruits and existing staff.

To meet this need, Mr. E. G. Brentnall, Signal Engineer, London Midland Region, has taken over accommodation in London. In addition, two railway coaches have been equipped as a mobile signalling school for instructional purposes at all the main centres in the Region.

One coach will be used as a lecture room with facilities for displaying film strips, lantern slides, and so on. Provision also has been made for the necessary amenities to enable the resident instructor to travel on rostered tours.

The second coach is equipped with an electric and mechanical signalling apparatus arranged to facilitate demonstrations of working in service conditions.

The principal feature in the demonstration coach is a representation of a signalbox with its associated controls, working to adjacent signalboxes. These controls include telegraph block working, using London Midland Region standard block instruments, and other types used by the railways which now constitute the London Midland Region. Among the various forms of block control are the "Welwyn" and others linked with track circuits, signal aspects, and levers.

"Occupied" and "clear" track circuit conditions are simulated by means of switches, and the corresponding track circuit indications are shown on an illuminated diagram and by separate indicators mounted on the block shelf.

A London Midland Region standard type mechanical 10-lever frame operates a set of mechanical facing points with lock and bar.

Semaphore signals, mechanically and motor operated, also colour-light signals, multi-lamp and horn type junction indicators are connected up for operation from the lever frame in conjunction with the associated controls. A slide-lever lock associated with the lever frame controls a two-lever ground frame.

Single-line working and electric token working can also be demonstrated and many other items of equipment are available for demonstration.

### Fault Tracing and Correction

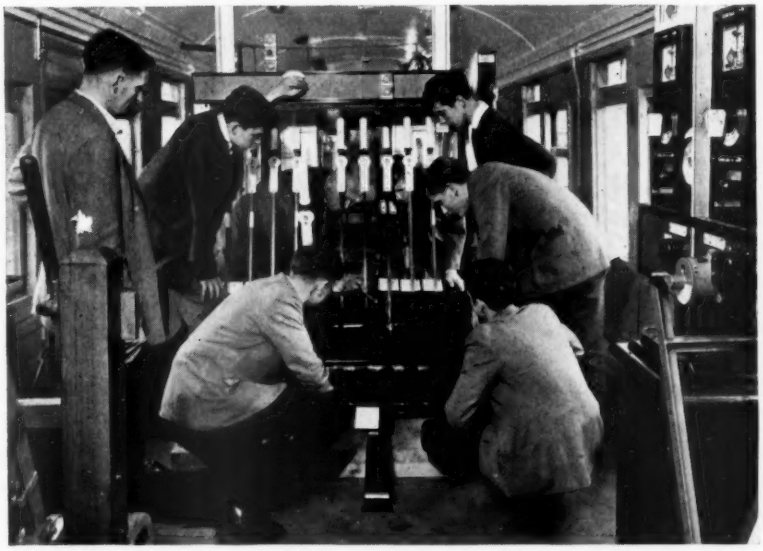
The control and indication circuits for this equipment have been arranged so that various types of faults which may occur in actual working conditions can be simulated. By this means instruction can be given on the best method of tracing and correcting faults.

Similar facilities are available for reproducing conditions of wear on mechanical point connections and the adjustments necessary to counteract it.

There are facilities for examining individual items of equipment. A complete set of standard mechanical and electrical drawings is also available.

Items of new signalling equipment will be introduced from time to time to keep pace with developments in design.

The general design and layout and installation and wiring of the equipment were carried out in the Signal Engineer's Telegraph Workshops, Crewe, under the supervision and to the requirements of Mr. E. G. Brentnall.

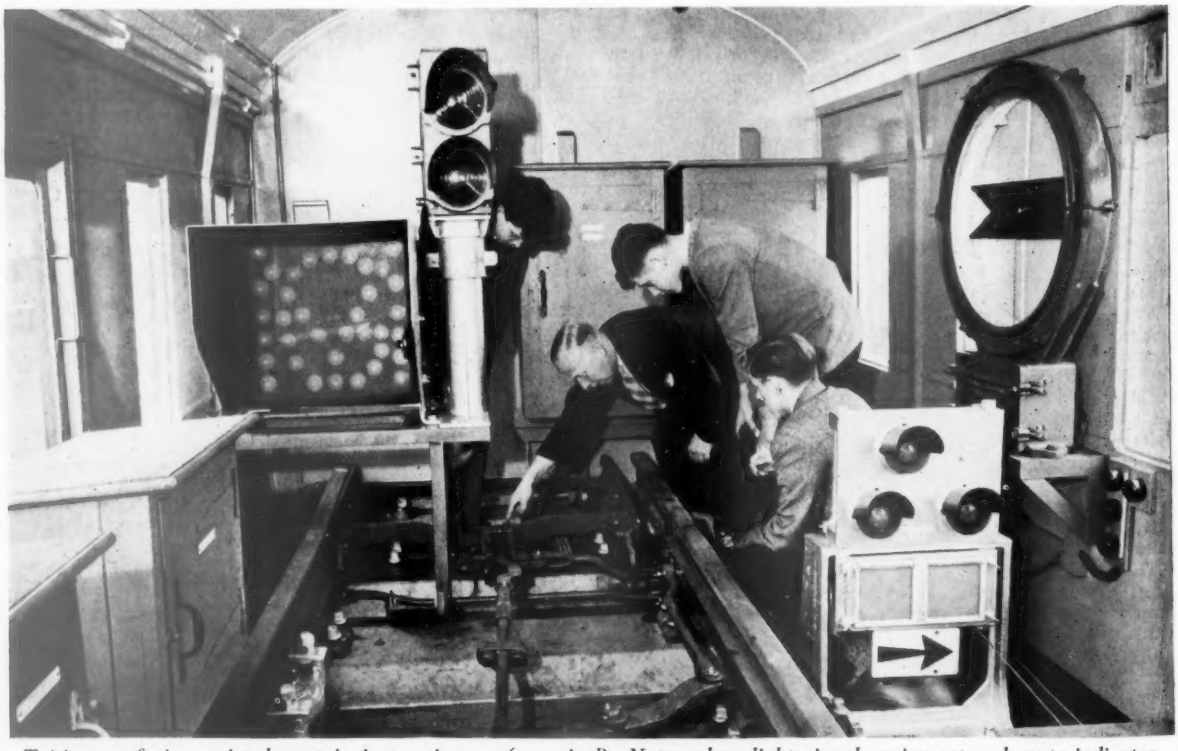


*Instruction on a manual lever frame. Full-size instrument panels on right*

XUM

# L.M. Region Mobile Signalling School

*Interior of instruction car (practical) showing (left to right) relay cabinet, driver's telephone, two-lever ground frame, signalbox interlocking lever frame, block instrument shelf, and track diagram*



*Tuition on facing point layout in instruction car (practical). Note colour-light signal equipment and route indicator, position-light ground signal with route indicator, and banner signal*

# Bridge Reconstruction on the Central Railway, India

*Replacement of 100- and 250-ft. spans, and strengthening of piers to carry heavier locomotives*

THE Central Railway main lines from Bombay to Delhi and Calcutta are connected by a 170-mile chord of branch-line standard between Jhansi and Manikpur. Its eastern section from Khairar to Manikpur also forms a link in an alternative through route to the important Allahabad-Kanpur main line of the Northern Railway. At present, however, its numerous and sometimes large bridges are capable of carrying only light Pacific "XA" class locomotives under a speed limit of 10 m.p.h.

For this reason the strengthening of these bridges was taken in hand in 1958. They include one span of 250 ft., 26 spans of 100 ft. and numerous 40-ft. and 20-ft. spans. The largest structure is the Ken Bridge consisting of one 250-ft. and twelve 100-ft. spans carried on high piers.

### Ken Bridge Strengthening

The strengthening of this 1,500-ft. bridge involved the widening and strengthening of the piers to support wider-spaced truss spans; it was effected by jacketing the original masonry piers with lightly-reinforced cement concrete throughout the entire height from foundation to bed-block level.

The old 100-ft. spans each consist of two under-slung deck trusses of a Warren type spaced 9 ft. between centres. They have cross-girders carrying longitudinal stringers on which rests continuous floor plating with longitudinal timbers bearing the rails.

Accordingly, the new 100-ft. spans were designed to consist of considerably-deeper (18-ft.) main trusses spaced 15 ft. 4 in. apart, so that they could be erected under traffic outside the old trusses. In order temporarily to carry traffic as and when the old spans are removed, the new cross-girders are designed to be connected to the trusses at a level below and clear of the old trusses in the first instance. Also, the new rail-bearers are carried temporarily on stools resting on the cross-girders in this lower position.

### Erection of 100-ft. Spans

On account of their 104-ft. length and 25-ton weight the new trusses are being fabricated in the Central Railway engineering workshops at Manmad with members less than 40 ft. in length. Subsequently they are assembled in a temporary girder-yard at the Jhansi end of the bridge, the pre-stressing and riveting up being done there before erection.

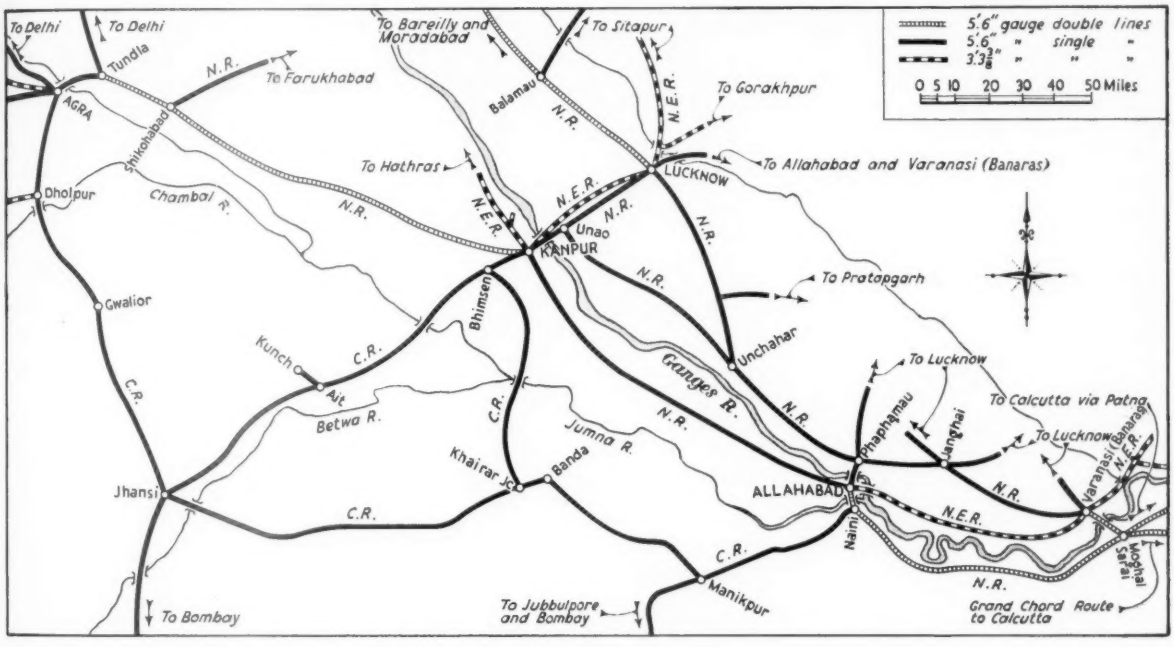
Because of the depth and under-slung design of the trusses, two four-wheel flat trucks were fitted with steel trestles of sufficient height and with swivelling arrangements on top to transport each truss from the yard to site with the bottom chord clear of the track. The swivelling bolsters enable turnout curves to be negotiated en route. The movement of each truss to site is carried out with the aid of a 15-ton crane at each end of the truss to steady the load and for lowering it on to its bearings beside the old girders. The new cross-girders are being lowered for fixing in their temporary positions through openings in the floorplates of the old spans. The work is being carried out with line occupation from 6 a.m. to 10 a.m. daily.

The jacketing of the piers was finished in April, but the work of placing the girders for the first span had begun on January 14 last. The complete change-over from the old girders and floor system of that span to the new was completed in a fortnight, and work is now proceeding on subsequent spans. It is expected that all the twelve 100-ft. spans will be completed and in service by March, 1960.

The design and erection of the 250-ft. span was rather more complicated, and consequently it was decided to call for tenders for the fabrication of the superstructure and to erect it with the aid of a service span. The latter, which is 260 ft. long and 45 ft. high, is being designed and fabricated at the Manmad shops. Work on it began in March and it was expected to be dispatched to the bridge site piecemeal between September and December.

The permanent 250-ft. span steelwork should be arriving from the contractors between November, 1959, and February, 1960, to enable erection to take place in March-April.

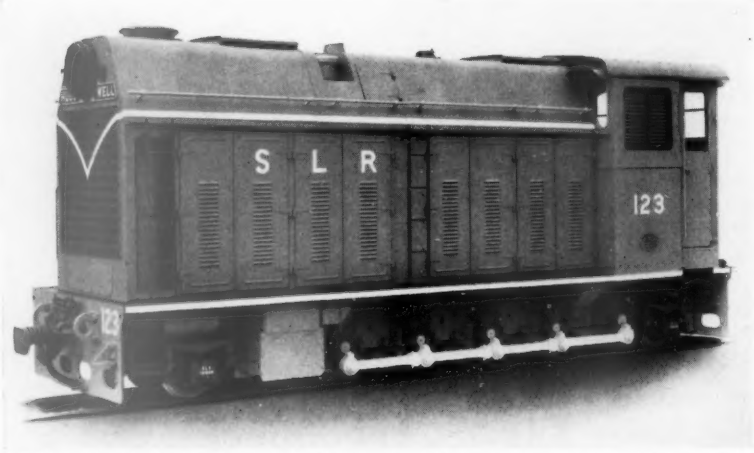
When this and the other bridges have been similarly strengthened and the line has been relaid with 90-lb. rails, standard loadings and 60-m.p.h. speeds will be permissible.




*Map showing Jhansi-Manikpur chord and the Allahabad-Manikpur-Khairar-Kanpur alternative to the Allahabad-Kanpur main line of the Northern Railway*

# Constant Horse-power Diesel Locomotive

*Hudswell Clarke "Enterprise" Mark II with Paxman "Hi-Dyne" engine and Fluidrive transmission*




*Hudswell Clarke* 2-8-2 *diesel locomotive for Sierra Leone with Paxman "Hi-Dyne" constant horse-power engine and Dual-Fluidrive transmission*

A FURTHER development of the constant horse-power engine and stepless mechanical transmission is the Hudswell Clarke "Enterprise" Mark II locomotive, 16 of which have recently been delivered to the Sierra Leone Railway.

Designed with a low axleload for passenger and freight haulage up to 24 m.p.h., this locomotive is a development of the "Enterprise" shunter introduced in 1955. Using the Paxman "Hi-Dyne" engine and Vulcan-Sinclair Dual-Fluidrive transmission the operating and performance characteristics are similar to those of a diesel-electric unit, but with the simplicity of a two-speed mechanical transmission. The gear change is automatic, according to locomotive speed, and tractive effort is maintained through the drive during the gear change operation. Power and speed are controlled by single lever operation.

Leading particulars are as follow :—

| | |
|---|---|
| Wheel arrangement | 1 D 1 |
| Weight in working order | 29 ton |
| Maximum axleload | 5 ton |
| Maximum tractive effort at starting and up to 6.15 m.p.h. | 11,250 lb. |
| Maximum speed | 24 m.p.h. |
| Fuel tank capacity | 290 gal. |
| | ft. in. |
| Gauge | 2 6 |
| Length over buffer beans | 25 0 |
| Overall width | 7 5¼ |
| Maximum height | 10 9 |
| Total rigid wheelbase | 9 0 |
| Wheel diameter—coupled | 2 4 |
| Minimum curve negotiable | 330 0 |

The full-width cab is arranged for driving from either side, with two seats and fully duplicated controls. A flat-top cabinet mounted against the front bulkhead houses the control equipment, with the hand-brake wheel on the front of the cabinet. In the centre of the front bulkhead is mounted the instrument panel, equipped with the normal range of brake gauges, engine instruments, speedometer, and fuel gauges.

Adjacent to the seats are louvred sliding panels, and half-drop windows are at the rear. The windows in the front bulkhead hinge inwards. Sound insulating material is applied to the cab roof and sides.

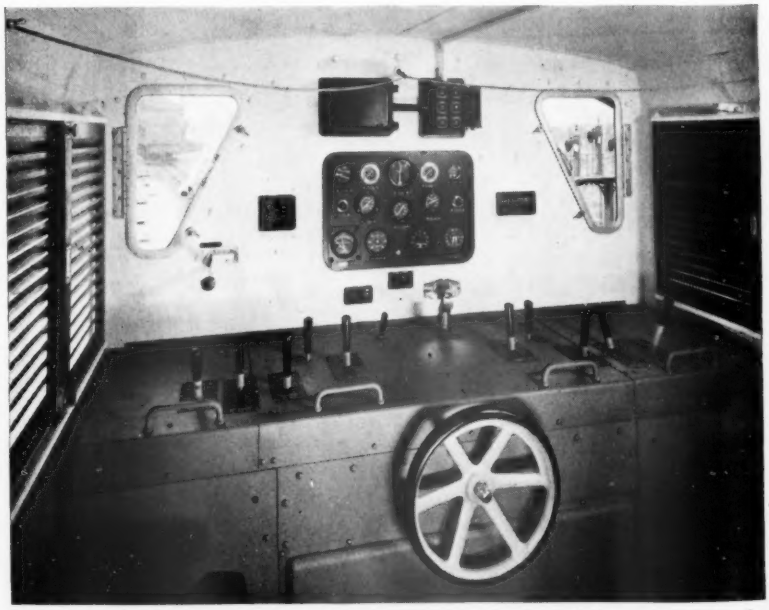
The engine housing, which is carried to the same height as the cab, is designed to ensure good accessibility for inspection and maintenance purposes. Four pairs of detachable hinged doors are fitted at each side and the roof is made in four detachable sections.

### The "Hi-Dyne" Principle

The six-cylinder diesel engine is the turbo-charged Paxman type 6YHXL, having a 7-in. bore and 7¾-in. stroke. Operating on the maker's "Hi-Dyne" principle, the engine is governed to provide a constant maximum horse-power of 225 over the working speed range of 625 to 1,250 r.p.m. This is the output obtained after derating for site conditions of 646 ft. altitude and an ambient temperature of 92 deg. F.

To obtain the constant horse-power characteristic the engine torque is progressively increased as the speed drops. Injection of the extra fuel required to produce the increased torque is controlled by an Ardleigh governor. By the use of this governor, which incorporates hydraulic servo and centrifugal flyweight units, the driver's throttle control determines the level of both the power obtainable and the engine speed. This characteristic is achieved by the use of a variable position fuel-stop under the control of an engine-driven speed sensing device. Pressure charging by a Napier blower ensures the smokeless combustion of the increased fuel charge required for the higher torque at slow speeds. Induction air to the blower is drawn through two heavy-duty Air-Maze oil-bath filters mounted in an external pocket in the roof.

The interchangeable cylinder blocks, arranged in vee form in two banks of three, are fitted with wet liners. The crankcase is a single iron casting, and the deep bearing caps supporting the under-slung crankshaft are securely clamped with transverse bolts in addition to the normal retaining studs. Attached to the fabricated-steel sump are the engine mounting brackets. Oil-hardened and alloy steel is used for the five-bearing crankshaft, which runs in



*Cab interior showing duplicated driving controls, central instrument panel, and sliding louvred side panels*

pre-finished steel shell copper-lead-lined bearings. Similar bearings are fitted to the big ends of the connecting rods which are of the fork-and-blade type. The external bearing surface of the fork rod is chrome-plated. The gudgeon pins are fully floating, running in silicon-bronze bushes. The single-unit aluminium-alloy cylinder heads each have four valves with renewable valve seats. All valves are operated by a single chain-driven camshaft located between the cylinders.

Individual C.A.V. fuel injection pumps are flange-mounted on the fuel-pump camshaft housing located in the engine vee. The fuel-pump camshaft is gear-driven through a jackshaft from the valve camshaft. The fuel supply to the pumps is pressurised and good service accessibility is given to all pumps and injectors.

Mounted externally on the crankcase is a high-pressure pump for bearing lubrication and a low-pressure pump for circulation of lubricating oil through the oil cooler. Full-flow cartridge-type filters are used in the high pressure circuit and an Auto-Klean strainer is in the cooling oil circuit. Between the engine and transmission gear is fitted a Holset flexible coupling.

### Belt-Driven Auxiliaries

Mounted on the right at the free end of the engine are the Westinghouse compressor and exhauster. On the left is the jackshaft assembly incorporating a scoop controlled fluid coupling which drives the fan and water pump. These auxiliaries are driven by vee belts from a front-end extension of the engine crankshaft.

With the constant horse-power engine the heat rejection, and consequently the cooling required, is constant over the working speed range. This requires a constant-speed fan and water pump, the drive for which is obtained from the variable engine speed by automatic control of the fluid-coupling scoop. The coupling is arranged to give minimum slip at a low engine speed and progressively increased slip as the engine speed increases. Multi-vee belt drives are used between the engine, coupling, and cooling units.

The Serck radiator mounted at the front end is fitted with banks of elements for water and oil cooling. A tubular cooler is connected in the engine water cooling circuit for the Dual-Fluidrive oil. The cooling fan is 41¼ in. dia., and is driven at 968 r.p.m.

### Automatic Gear Change

The Dual-Fluidrive transmission incorporates two Vulcan-Sinclair fluid couplings and a two-speed gearbox built into one self-contained unit. Each coupling drives one gear train and changes between the two ratios are made by filling one of the fluid couplings with oil while the other is emptied. Gear changes are thus made without interruption in the drive, and a built-in control system automatically determines the point, according to the locomotive speed, at which the changes are made.

The main elements of each fluid coupling are an impeller, connected to the engine, and a runner which is the output member. Between them these form a working circuit. The two impellers are both driven from the input shaft of the transmission. The runner in the left-hand circuit is carried on a solid shaft which drives the low-gear pinion while the other runner is mounted on a hollow shaft which carries the high-

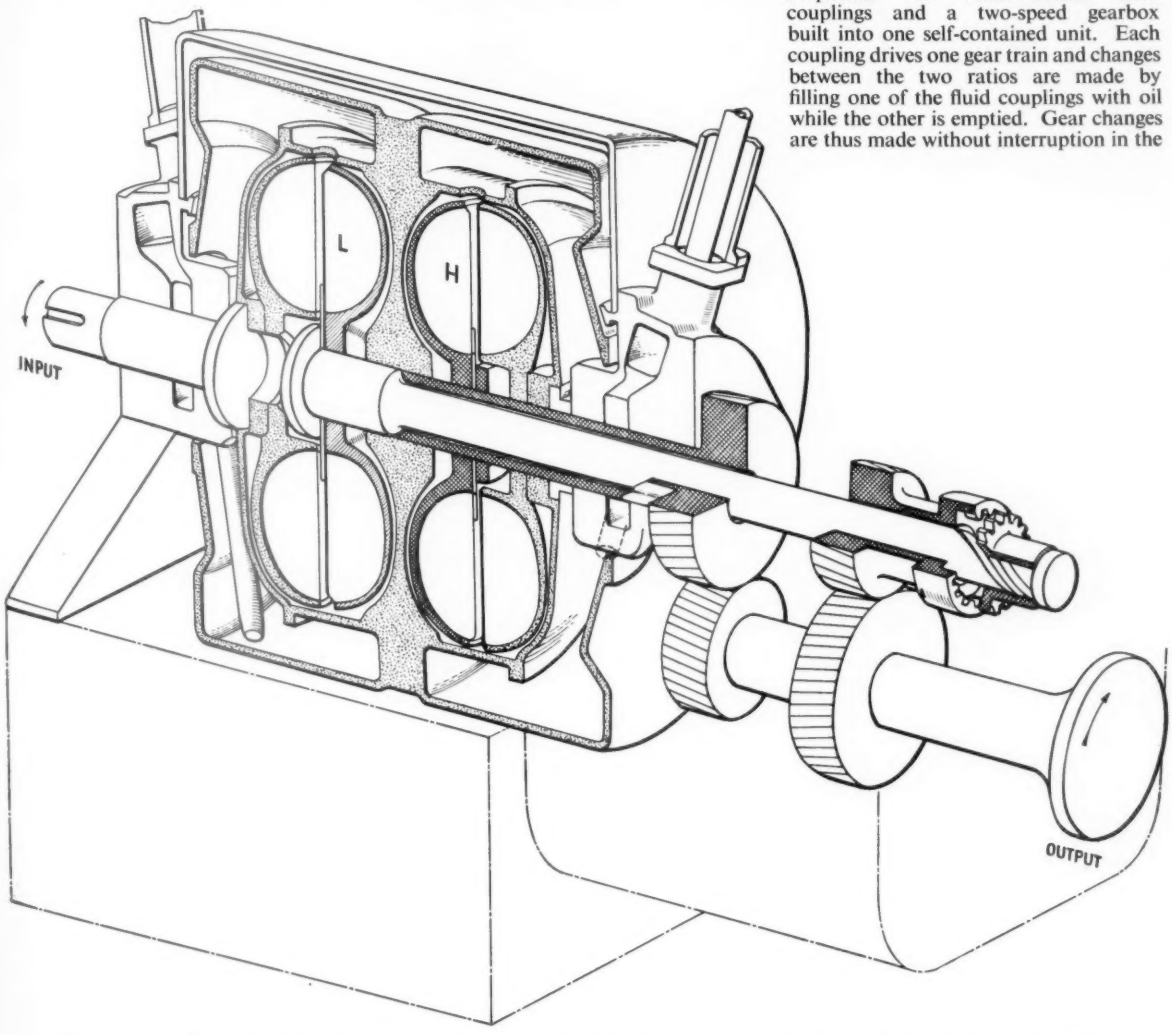
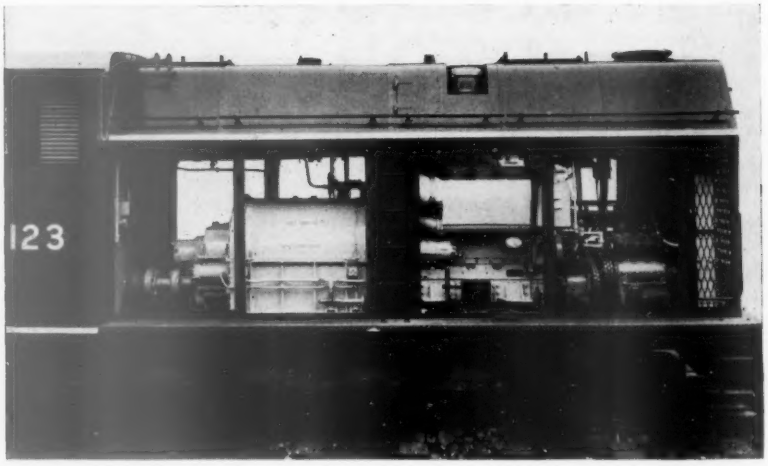



*Diagram of Dual-Fluidrive incorporating two-speed gear. Ratio is* 1·414 : 1 *when coupling circuit L filled :* ·707 : 1 *when circuit H filled*




*Locomotive with hinged doors removed showing good access to engine, transmission, and auxiliaries. Note belt-driven compressor and exhauster on right*

gear pinion. The change from low to high gear is effected by transferring the oil from the left hand working circuit into the right-hand circuit. As this change is effected by oil transfer from one fluid coupling to the other, the drive is maintained throughout the gear change. When the oil is emptied from both circuits the transmission will be in neutral and in this condition, with the locomotive stationary, changes to forward or reverse can be made in the final drive gear.

The constant-mesh two-speed gear is of simple construction, comprising two pairs of single helical hardened and ground gears, with the output drive taken from the layshaft. The drive to the low-gear pinion is transmitted from the shaft through an S.S.S. clutch. When in high gear this clutch automatically disengages so that the low-gear runner is not driven at an excessive speed.

The Fluidrive transmission is controlled from the driver's engine speed regulator, and with the engine idling the transmission is in neutral. As the engine is accelerated the low-gear circuit fills and the locomotive moves off in low gear. At the pre-set speed the change to high gear is made automatically. Similarly with falling speed an automatic change from high to low gear is made. With the low gear engaged the locomotive speed is 6·15 m.p.h. and 12·15 m.p.h. at 650 r.p.m. and 1,250 r.p.m., respectively. At the same engine speeds the locomotive speeds are 12·23 m.p.h. and 24·13 m.p.h. with the high gear engaged.

From the Fluidrive transmission the drive is taken through a Layrub carden shaft to the final-drive gearbox. This is a Bostock & Bramley reduction unit fitted with air operation for forward and reverse.

The main frame structure is of riveted construction, with bolted-on buffer beams. Central couplers are fitted. Similar in design to the bogies fitted to the S.L.R. Beyer-Garrett locomotives, the front and hind trucks are of the radial arm type. Laminated springs are fitted to the two-wheeled trucks and to the coupled axles. The axle boxes are Timken taper-roller bearings, the horn guides being fitted with manganese-steel adjustable liners.

The Westinghouse air brakes operate a single cast-iron brake shoe on each coupled wheel, powered from the two-cylinder compressor. The handbrake is connected through the power brake rigging. The brakes are vacuum controlled, the train brakes being operated by the Westinghouse three-cylinder exhauster.

The fuel tank and brake air reservoirs are mounted above the transmission gear. Stones Tonum 14-in. headlamp of 250 W. rating is fitted at each end of the locomotive and the Nife nickel-cadmium alkaline battery is of 210 Ah. capacity.

Sub-contractors for the locomotive include :—

| | |
|---|---|
| Brake equipment and warning horn | Westinghouse Brake & Signal Co. Ltd. |
| Power unit ... ... | Davey, Paxman & Co. Ltd. |
| Engine governor ... | Ardleigh Engineering Limited |
| Fluidrive transmission | Fluidrive Engineering Co. Ltd. |
| Final drive gearbox ... | Bostock & Bramley Limited |
| Electric starting equipment | C.A.V. Limited |
| Electric lighting ... | J. Stone & Co. (Deptford) Ltd. |
| Instruments ... ... | Smiths Industrial Instruments Limited |
| Axle boxes ... ... | British Timken Limited |
| Radiator ... ... | Serck Radiators Limited |
| Driver's seats ... ... | Evertaut Limited |
| Windows ... ... | Kellett Engineering Co. Ltd. / Beckett, Laycock & Watkinson Limited |

## Diesel Railcar Operation by the Canadian Pacific Railway

*Canadian Pacific Railway Dayliners on the Toronto-Detroit service. The two diesel-powered units are RDC-1 cars built by the Budd Company, Philadelphia*

# RAILWAY NEWS SECTION

## PERSONAL

Mr. A. A. A. Cardani, Assistant to the Signal Engineer (General), Western Region, British Railways, has been appointed Signal Engineer.

Mr. Donald Hamish Cameron of Lochiel, T.D., who, as recorded in our October 9 issue, has been appointed Chairman of the Scottish Area Board of the British Transport Commission, is a Chartered Accountant and a County Councillor for Inverness-shire. He was educated at Harrow and Balliol College, Oxford, and joined the Lovat Scouts in 1929, attaining the rank of Lt.-Colonel in 1945. He later served in the Territorial Battalion of the Queens Own Cameron Highlanders. In 1954 he was awarded the 1st and 2nd Clasp to the Territorial Efficiency Decoration. Mr. Cameron is prominent in local government and Highland affairs. He was made a part-time Member of the British Transport Commission in August, 1954, as being conversant with the circumstances and special requirements of Scotland. In February, last year, he was made a Member of the Police Committee, British Transport Commission. Mr. Cameron succeeds Sir Ian Bolton, a biography of whom was published in our September 11 issue.

Mr. B. T. Pratt, a nominee of the British Transport Commission, has been appointed a Member of the Transport Users' Consultative Committee for the North Eastern Area until May 31, 1960, in place of Mr. A. T. Evans who has retired from the service of the Commission. Mr. B. T. Pratt is General Manager of United Automobile Services Limited, Darlington.

Mr. C. F. E. Harvey, Assistant Divisional Traffic Manager, London, Western Region, British Railways, was transferred to Paddington as New Works Assistant to the Operating Superintendent in 1953 not 1935, as stated in his biography on page 279 of our issue last week.

*Mr. D. H. Cameron of Lochiel*
Appointed Chairman of the Scottish Area Board, B.T.C.

*Sir Francis Glyn*
Member of the London Midland Board, B.T.C., 1955-59

Mr. H. C. Johnson, General Manager, Eastern Region, British Railways, has accepted office as President of the Railway Students' Association, 1959-60.

Mr. S. J. Judson, Assistant Regional Establishment & Staff Officer, North Eastern Region, British Railways, has been appointed Regional Establishment & Staff Officer.

Mr. D. P. Mathur, Senior Deputy General Manager, Central Railway of India, has been appointed Director of Finance, Indian Railway Board.

We regret to record the death on October 7, at the age of 60, of Mr. C. U. Patel, Accountant in charge of the Establishment Section, East African Railways & Harbours.

Mr. John G. Bridges, Director-General of the British Travel & Holidays Association, left London Airport on October 12, for Latin America. He will visit six countries, in which he will speak about the tourist attractions of Great Britain.

Admiral Sir Michael M. Denny has been appointed a Director of Cammell Laird & Co. Ltd.

Sir Francis Glyn, K.C.M.G., Member of the London Midland Area Board of the British Transport Commission, who as recorded in our October 9 issue, has retired from this position, on medical advice, was born on August 9, 1901. He was educated at Eton College, afterwards entering business in the City of London. He is Chairman & Managing Director of Glyn Mills and Company as well as a Director of a number of companies, including Leibigs Extract of Meat Co. Ltd., Oxo Limited, Thames Side Properties Limited, the Royal Bank of Scotland, and the Alliance Assurance Company. He was made a Director of the London Midland & Scottish Railway Company in 1943, remaining on the board until nationalisation. He is Deputy Chairman of the Bank of London & South America Limited; Chairman of Greenfriar Investment Co. Ltd., and of Lowland Investment Co. Ltd. Sir Francis Glyn is Deputy Chairman of the Advisory Council of Export Credits Guarantee Department of the Board of Trade. He was created a K.C.M.G. in 1954. He has been a Member of the London Midland Area Board, B.T.C., since 1955. As recorded last week, Maj.-General G. N. Russell succeeds Sir Francis Glyn as a Member of the London Midland Area Board. His biography was published on page 221 of our February 20, 1959, issue, on his appointment as a full-time Member of the British Transport Commission.

Mr. L. N. Kaula, Divisional Accounts Officer, Northern Railway of India, has been appointed Officiating Deputy Chief Accounts Officer, Central Railway. He succeeds Mr. K. V. Kasturi Rangan, who has been appointed Financial Adviser & Chief Accounts Officer, South Eastern Railway.

We regret to record the death on October 3, at the age of 72 of Sir Herbert Merrett, J.P., Chairman of the Western Area Board, British Transport Commission from January to June, 1955. Sir Herbert Merrett was a former Chairman of Powell Duffryn & Co. Ltd., Cory Brothers & Co. Ltd., and Cambrian Wagon & Engineering Co. Ltd. He had also been a Director of the National Provincial Bank Limited, Eagle Star Insurance Co. Ltd., and of several other companies, both at home and abroad. He was a member of the Court of Governors of the University College of South Wales & Monmouthshire. He was President of the British Coal Exporters' Federation 1935-36 and High Sheriff for Glamorgan in 1934-35. Sir Herbert Merrett was elected Chairman of the Western Area Board, British Transport, in January, 1955, but was obliged to relinquish the position in June that year, because of ill-health. He remained on the Board, as an ordinary member until his retirement in 1956.

*The late Sir Herbert Merrett*
Chairman, Western Area Board, B.T.C., January-June, 1955

*Mr. J. P. Anderson*
Appointed Chief Electrical Engineer, South African Railways

Mr. Saradindu Sen, Chief Signal & Telecommunication Engineer, Northern Railway of India, has retired.

We regret to record the death on October 11, at the age of 68, of Mr. O. Pirow, Minister of Railways & Harbours, South Africa, 1933-39.

Mr. C. H. Flurscheim, a Director and Chief Electrical Engineer of Metropolitan Vickers Electrical Co. Ltd., has been co-opted to serve on the Council of the British Welding Research Association.

Mr. F. V. Thompson has been appointed Director of Personnel, British Insulated Callender's Cables Limited, and has relinquished his position as Secretary of the company. Mr. J. P. Hourston, Assistant Secretary, since 1946, has been appointed Secretary. Mr. G. V. Tew, who is a solicitor and has been on the legal staff for seven years, is now Assistant Secretary.

Mr. S. A. Roberts has been appointed Managing Director of B.S.A. Tools Limited.

Mr. C. F. Gimson has been appointed Divisional Assistant Chief Engineer, Motor Control Gear Division, Associated Electrical Industries Limited.

Mr. R. N. Davies, Works Director, Cowley, Pressed Steel Co. Ltd., and Chairman of the Motor Car Body Divisional Board, has been appointed a Local Director of the company.

Mr. Henry R. Barber, Chief Engineer, Car Body Division Pressed Steel Co. Ltd., has been appointed a member of the Motorcar Body Divisional Board, as Assistant Director of Engineering.

Mr. D. C. H. McLean has been appointed Managing Director of the Lamson Engineering Co. Ltd. He succeeds Mr. R. L. Herring, who has resigned the Managing Directorship for reasons of health, but retains his seat on the board.

Mr. A. V. Sugavaneswaran, District Controller of Stores, Integral Coach Factory of India, has been appointed Officiating Deputy Controller of Stores, Chittaranjan Locomotive Works.

Mr. J. P. Anderson, M.I.E.E., Assistant Chief Electrical Engineer, South African Railways, who, as recorded in our September 9 issue, has been appointed Chief Electrical Engineer, was born in 1904. Mr. Anderson joined the railway, in 1920, as apprentice electrician and has served in various parts of South Africa. The Railway Administration sent him to England, in 1928, for two years' training with the General Electric Co. Ltd. In 1933 he became Assistant Engineer (Electrical), and, in 1941, Electrical Engineer. In 1952 he was made Inspection Engineer (Electrical) Maintenance, and, in 1957, was appointed Assistant Chief Electrical Engineer (Maintenance). Mr. Anderson is a member of the Council of the Witwatersrand Technical Colleges. He was President of the South African Institute of Electrical Engineers in 1954 and for many years was a member of the National Apprenticeship Board. He was awarded a certificate of appreciation for services rendered during the Royal Tour of South Africa in 1947.

Mr. G. B. Gray has been appointed a Director of the Trent Motor Traction Co. Ltd., Mr. T. P. Strafford has resigned from the board.

Mr. P. Boden, Technical Assistant, District Engineer's Office, Peterborough, Eastern Region, British Railways, has been elected an Associate Member of the Institution of Civil Engineers.

*Mr. F. D. Rose*

Appointed Public Relations Officer London Transport Executive

Mr. F. D. Rose, Senior Assistant to the Public Relations Officer, London Transport Executive, who, as recently recorded, has been appointed Public Relations Officer, is 60. Mr. Rose joined the London General Omnibus Co. Ltd. in 1921 and, until 1933, was employed in the department of the Operating Manager. On the formation of the London Passenger Transport Board, in 1933, he was transferred to the Parliamentary Office and became responsible for all matters in connection with the licensing of road services in the London Passenger Transport area. In 1948 he was appointed Senior Assistant to the late Mr. W. R. Robertson, the Public Relations Officer.

Mr. R. A. Turpin has been appointed Manager, Exeter Branch, British Insulated Callender's Cables Limited, on the retirement of Mr. H. F. G. Bicker.

We regret to record the death on August 30, at the age of 57, of Mr. A. P. Curtis, Director & General Sales Manager, British General Electric Co. Pty. Ltd. (Australia).

Mr. D. J. Doughty, Assistant Docks Engineer, Southampton, British Transport Commission, has been elected a Member of the Institution of Civil Engineers.

Mr. Jagjit Singh, Regional Superintendent, South Eastern Railway of India, has been appointed Officiating Chief Operating Superintendent, Western Railway. He succeeds Mr. D. R. Khanna, who is transferred to the Central Railway in the same capacity.

The Timber Trade Federation of the United Kingdom has appointed Sir Harold Emmerson, who, until recently, was Permanent Secretary, Ministry of Labour & National Service, to examine the constitution of the Federation and of the Timber Development Association and to make recommendations as to finance, research and publicity.

Mr. Noel Taylor, Manager, Sheffield Office, Thos. Cook Son Ltd., since 1951, has retired. Mr. Taylor joined the company as messenger at the Oldham branch, in 1909, and has worked at branches in Manchester, Newcastle, Sunderland and London. He is a Past-President of Sheffield Skal Club and a Rotarian. He will be succeeded by Mr. James Simpson.

*Mr. F. W. Baker*

Appointed Economic Survey Officer, London Midland Region

Mr. F. W. Baker, Principal Traffic Costing Officer, London Midland Region, British Railways, who, as recorded in our August 28 issue, has been appointed Economic Survey Officer, joined the London & North Western Railway, in 1918, in the London District Goods Manager's Office. He later moved to the Staff Executive Investigation Office, the L.M.S.R. in 1929. During the 1939-45 war Mr. Baker was loaned to the Ministry of Transport, and on the formation of the British Transport Commission was appointed Personal Assistant to the Controller. Subsequently, he was made Assistant to the Director of Costings and became Principal Traffic Costing Officer of the London Midland Region in 1953.

Mr. R. Roscoe, Assistant (Organisation & Methods), Chief Civil Engineer's Office, Paddington, Western Region, British Railways, has been appointed District Engineer, Crewe, London Midland Region.

Mr. B. B. Bansal, District Controller of Stores, Western Railway of India, has been appointed Officiating Deputy Controller of Stores on that railway. He succeeds Mr. D. V. Phatarpekar, who is on retirement leave.

Mr. A. R. Milne, European Commissioner of Colonisation, Canadian National Railways, has retired. He is succeeded by Mr. M. Bowley, Superintendent of British Emigration, C.N.R. Mr. G. B. Cartmel, Assistant Superintendent of Emigration, succeeds Mr. Bowley.

Mr. Kenneth Walker, formerly Works Director, Laycock Engineering Limited, and Mr. Eric Thompson, formerly Commercial Director, who have been acting as Joint General Managers, have been appointed Joint Managing Directors of the company.

Mr. H. J. Eley, Manager, E.S. & V. Department, General Electric Co. Ltd., has retired. Mr. F. Sampson, Manager, Government & Railways Department, will retire on March 31. Mr. I. M. Milsted has been appointed Manager of the department and Mr. E. J. Masters becomes Deputy Manager. Until his retirement, Mr. Milsted will work on selected duties and, for the time being, will continue to be responsible for the Bath (Admiralty) Office.

*Mr. R. W. Clampitt*

Stationmaster, York, North Eastern Region, 1953-59

Mr. R. W. Clampitt, Stationmaster, York, North Eastern Region, British Railways, who, as recorded in our September 11 issue, has retired, began his railway career at York, as messenger in the Telegraph Office, in 1909. He was appointed signalman at Bishop Auckland, in 1916, and moved to Thirsk in 1919. For health reasons he transferred from signalling work and served in various offices including the Falsgrave Control, Scarborough. Later he became Temporary Assistant Controller, Main Line Control, York. In 1933 he was made Signalmen's & Trains Inspector, Sunderland District, and moved to a similar position in Scarborough in 1935. Later he was District Trains Inspector at York and, in 1940, became Assistant Yardmaster at York. In 1943 Mr. Clampitt was appointed Yardmaster, at Leeds (Neville Hill), and subsequently at West Hartlepool, Newport (Tees-side) and Doncaster. He became Stationmaster, York, in 1953.

Mr. A. E. Bell, General Sales Manager, Distington Engineering Co. Ltd., has been appointed Commercial Manager, and will assume responsibility for the Buying Department.

Mr. F. V. Thompson has been appointed Director of Personnel, British Insulated Callender's Cables Limited. He relinquishes the position of Secretary & Manager (Personnel). Mr. J. P. Hourston has been appointed Secretary, and is succeeded as Assistant Secretary by Mr. G. V. Tew.

Mr. Douglas Sharp and Mr. Graham Donald have retired from executive management of Scottish Machine Tool Corporation Limited. Mr. Sharp continues as Chairman and Mr. Donald retains his seat on the board. Mr. A. Bennie has been appointed Sales Manager.

Mr. F. L. Timmins has been appointed a Director of the Associated Automatic Machine Corporation Limited. He has resigned from the board of the British Automatic Co. Ltd., of which he was Managing Director, and from the boards of its subsidiaries. Mr. B. M. Till, Chairman of Associated Automatic Machine Corporation Limited, has resigned from the board and from the corporation's subsidiaries because of his other commitments.

XUM

# NEW EQUIPMENT AND PROCESSES

## Lifting Magnet

THE Liftmaster is a new circular lifting magnet which is claimed to offer definite advantages over the conventional bolted design. Of welded construction and moistureproof, it gives unusual dependability and improved pick-up for nominal diameter. The peripheral face is completely free from projections.

At present, its manufacture is restricted to three sizes: 52 in., 62 in., and 72 in. Further details can be obtained from Rapid Magnetic Limited, Lombard Street, Birmingham 12.

## Tangential Threader

THE "MB" range of Maiden tangential threading machines has been enlarged by the addition of the 6-in. pipe capacity model illustrated on this page.

Fitted with an all-steel tangential diehead having a capacity of 2½-6 in. pipes, the machine has nine spindle speeds from 9 to 73 r.p.m. All sliding gears are hardened and fitted on splined shafts, which are ball-bearing mounted. The headstock is pump-lubricated and the spindle is mounted in replaceable phosphor-bronze bearings.

The narrow-guide saddle covers a long bearing surface to provide accurate alignment and resistance to wear, and the hammer-action vice is claimed to eliminate operator fatigue. The machine is shown with lead screw-control to the saddle. This feature is optional. It will be noticed that both rack and screw are guarded against dirt and cuttings. A special saddle permits easy removal of the self-centring vice to leave a completely flat machined surface on which any fixture can be mounted.

Further details can be obtained from Landis Machine-Maiden Limited, Maiden Division, Hyde, Cheshire.

## Developments in Seal Design

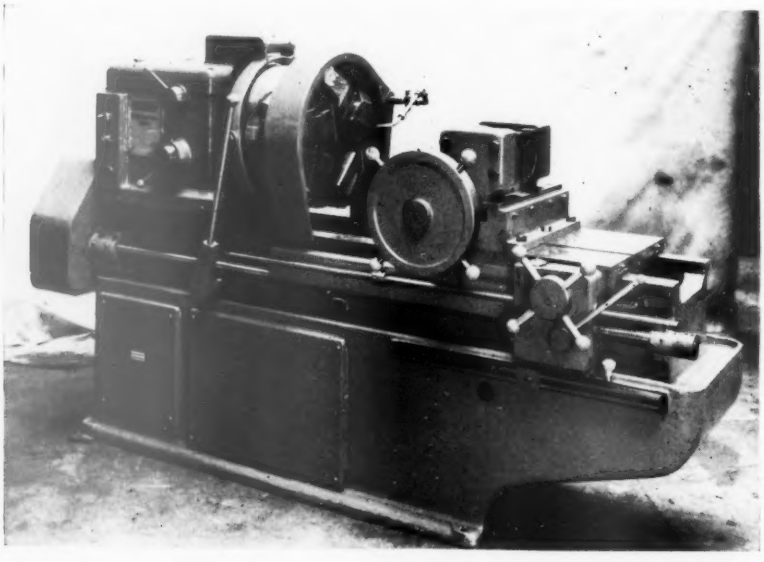
PREMATURE failure occurring in mechanical shaft seals sometimes can be traced to temperature conditions exceeding those for which the seals components were designed, although the actual temperature at which the liquid was handled was lower than the limit imposed by those components.

Extensive tests recently carried out have established that the increase in temperature occurs between the seal faces and is transmitted to the body of the seal. As a means of dissipating the heat, seals have been designed with extended surfaces which provide a greater area through which the heat can be transmitted to the coolant liquid. Their introduction has made possible the use of simple seals and seal arrangements on liquids at much higher temperatures than was previously possible. The only limiting factor is that of the temperature limits of the other components of the seal.

The new designs, which are the subjects of various British, European, and U.S.A. patents, were developed by Crane Packing Limited 157, Victoria Street, London, S.W.1, from which company further details can be obtained.

## Train Lighting

A NEW and inexpensive method of train lighting which converts a 24-W. d.c. supply to a.c. allows the apparatus to be housed with the lamp's normal control equipment, and obviates the need for the customary 24-V. d.c. motor driving an alternator at 400 cycles. A 24-V. cable can be used throughout the wiring system.



There are no moving parts and consequently virtually no maintenance.

The lighting units consist of two transistors; a transformer with three windings (primary, feedback, and secondary); starting capacitor, and resistor to control the value of the feed-back current. Each transistor cuts out in turn, reversing the polarity of the supply, to give an output to the lamp from the high-resistance transformer at 250V., 1,250 cycles. One 4-ft. 40-W. lamp or two 2-ft. 20W. lamps, in series, can be run from the circuit.

Further details can be obtained from the A.E.I. Lamp & Lighting Co. Ltd., Melton Road, Leicester.

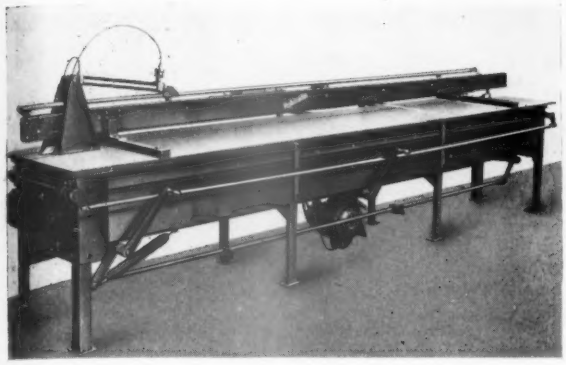
## Contracting for Coatings

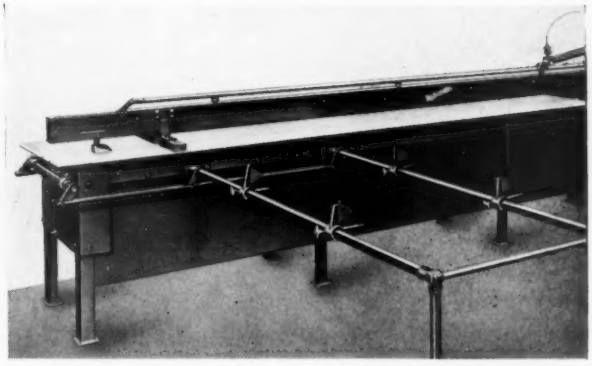
COATING Contractors Limited of Buckingham has been formed as a subsidiary of E. & F. Richardson Limited, manufacturers of Adcora corrosion-protective high-build coatings, to specialise in the application of external and internal surface treatments.

A factory is being built for Coating Contractors Limited adjoining that of the parent company and containing latest equipment for surface preparation, coating application, and material handling. The close integration between the two companies enables contracting work to be undertaken with first-hand knowledge of technical developments by the manufacturer, from which assistance is available in preparing special or modified coatings to suit particular requirements. Coating materials used include neoprene (synthetic rubber), Hypalon, and Vitron for elastomeric properties; epoxy, phenolic, vinyl, and alkyd resins for hardness; chlorinated, cyclised, and isomerised rubbers; styrene butadiene.

A coating may be required to have good elongation and to withstand high temperature, high humidity, and chemical attack from acids, alkalis, or salts. It may be subjected to conditions which would cause cavitation erosion, and the liquid handled is likely to be abrasive.

For identification purposes, a colour finish may be required. The Adcora high-build coatings are up to $\frac{1}{16}$ in. thick for valves and chemical mixers, but a more usual thickness of lining for a pipe or tank is 0·040 in. The latter might consist of Neoprene-Adcora P7 primer applied to the blast-cleaned metal





surface, two or three Neoprene-Adcora P6 under-coats totalling about 0·030 in. to give protection against most normal chemical concentrations, over-coated by 0·010 in. of Adcora Hypalon H2 as a protection against strongly oxidising agents and to give the colour finish required.

The application of individual coats about three times the thickness of build allowed with safety for normal coal tar epoxy enables the total thickness necessary for mechanical strength to be obtained at minimum labour cost. The majority of coatings are applied by airless methods. Coating Contractors Limited can handle loads of up to 10 ton at its Buckingham plant; it also has a fully-equipped site team.

## Saw Attachments

TWO new optional attachments greatly improve the efficiency of the Robinson Patent EU/T Pan-L-Saw. These, a pneumatically-operated pressure beam and remotely-controlled dimension gauges, allow the operator to control the full operating cycle of cutting to length and width from one position. They minimise re-handling, confine the operation cycle to starting the cut and considerably reduce operator fatigue.

The pneumatic cylinder for the pressure beam is controlled through valves by the saw-operating lever. This clamps the material to the table, when the saw is brought into position and the forward traverse engaged. After cutting, the saw carriage strikes a pre-set, adjustable, knock-off catch and is lowered below table level to return to starting position while also automatically lifting the pressure beam to allow immediate off-loading.

The remotely-controlled dimension gauges consist of two pairs of stops mounted on graduated bars at the outfeed side of the machine. The indexing faces of each pair are pre-set parallel with the cutting line. Either pair can be brought in use by a control shaft on the infeed side of the machine.

A single operator can cut sheets to both length and width, perfectly square, at consecutive handlings. He can also feed through on a continuous-flow basis, thus eliminating the need for re-handling cut pieces.

The machine will handle sheets up to 10 ft. × 1 in. in plywood, blockboard, chipboard, accoustic board, and especially laminated plastic. It is equally effective on single or multiple sheets, and, as the material is held along the saw-line by a full length beam, the cut is clean and free from spelching, scuffing, and saw-line fracture.

Other optional features include hand traverse and cut-out beam for cutting small panels from large sheets, indexing fingers for cutting embossed or punched boards in correct relationship to the pattern, and appearing stops for multiple cutting.

Further details can be obtained from the manufacturer, Thos. Robinson & Son Ltd., Rochdale.

## Mobile Staging

MOVE-ON is a new form of adjustable staging which is mobile and self-propelling. The platform can be set in six different positions between 2 ft. and 3 ft. from the ground allowing access to working heights up to 12 ft.

Mobility is achieved by rotation of a handle on the platform rail. A second handle works the Ackerman steering gear. By these controls (so light that a girl can work them with ease), the operator can move without assistance. The standard machine will pass through a 6-ft. 6-in. × 2-ft. 6-in. doorway.

The unit is capable of holding the heaviest man and his equipment. A fixed handrail ensures complete security and carefully-positioned rungs provide easy access to the platform. Wheels have rubber tyres and a safety brake holds the staging firmly in place while in use.

Maintenance-free, and galvanised against rusting, the unit and its container together weigh only 94 lb. Cost is £27 10s. ex-works.

Further details can be obtained from Anderston Clyde (Midlands) Limited, Irk Vale Works, Chadderton, Manchester.

## Ceiling Lighting

GREATER flexibility in planning lighting installations is claimed through use of an enlarged version of the Lumenated Module system. This, based on a 3-ft. module, is designed to fit the same aluminium-alloy supporting track and suspension system as that used in 2-ft. module installation.

Large areas can be covered with less than half the number of diffusing panels required with the 2-ft. system.

Further details can be obtained from Lumenated Ceilings Limited, Alliance House, Caxton Street, London, S.W.1.

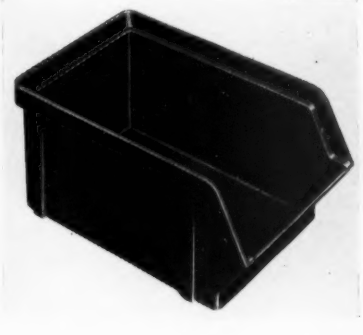
## Stacking Storage Bins

PLASTIBOX storage bins are moulded from high-impact polystyrene or nylon and can be stacked. Polystyrene is inert to a wide range of chemical agents and both materials are resistant to most non-concentrated acids and oils. The bins are practically unbreakable and will wear indefinitely. They are suitable for the storage of large or small components and are available with transparent dust-covers. A variety of colours makes identification of contents quick and positive.

The mounting rails will take five of the three smaller sizes of bins—sizes range from 3½ in. x 3¾ in. x 1⅞ in. to 9¼ in. x 5½ in. x 5 in. in both materials and, in the case of polystyrene, to 19½ in. x 11⅞ in. x 7 in.

Prices of the bins alone vary from 1s. 9d. to 32s. 5d. according to material. Covers similarly vary from 2s. 6d. to 24s. 9d., and mounting rails for 5 bins cost from 4s. 9d. to 11s. 9d. according to size of bin.

Further details can be obtained from Components (Barnet) Limited, 13, Byng Road, Barnet, Herts.



# Ministry of Transport Accident Report

*Hitchin, November 19, 1958; British Railways, Eastern Region*

Brigadier C. A. Langley, Chief Inspecting Officer of Railways, Ministry of Transport & Civil Aviation inquired into the accident which occurred at about 4.30 a.m. on November 19, 1958, at Hitchin when the 3.25 a.m. Class "E" freight train, London-Peterborough, consisting of 47 loose coupled empty wagons and van drawn by a class "9F" 2-10-0 engine, passed the Wymondley intermediate automatic signal at danger and collided at about 15 m.p.h. with the 2.28 a.m. class "E" freight train, also London-Peterborough, consisting of a similar engine hauling nine loaded and twenty-nine empty loose coupled wagons and van, which had begun to move away from the inner home signals.

Some of its vehicles became derailed across the up main line and were struck almost immediately by the 10.35 p.m. freight train, Leeds to London, consisting of 27 loaded wagons and van drawn by a class "V2" 2-6-2 engine. Its driver heard detonators at Hitchin South box but had no time to take effective action. Another freight train approaching on the down goods line was stopped at Stevenage. Five trainmen were slightly injured or suffered from shock but none was detained in hospital. A considerable amount of damage was done and a light engine on the up slow line overturned; a signal gantry was demolished. Removal of the wreckage was a formidable task and all four lines were not reopened until 8.5 a.m. the following day. It was dark with dense fog at Hitchin, although clear at Stevenage. The accompanying diagram shows the lines signals, etc., essential to an understanding of the case. (The report contains a detailed statement of the working of all the signals with tables of track circuit and other controls, signal spacing, sighting distances and other relevant information.)

### Course of Events and Evidence

The weather generally was clear south of Hitchin and at Stevenage North the signalman could see some 1,200 yd. and the auto inner distant signal (see plan) which was confirmed by the driver of a train arriving there directly after the accident, but the enginemen of the 3.25 train alleged it was very foggy from Knebworth and the driver of the preceding one said he saw the auto stop signal only at close range. A signalman living near it said he could see it at about 300 yd. At about 4.0 a.m. the weather deteriorated rapidly at Hitchin and by 4.20 the fog was so dense that fogmen for all signalboxes there were called out. Soon after visibility was only 10 to 30 yd.

The signalman at Stevenage North said the second train passed at 4.24 when he spoke for a second time with Hitchin South and learned that fogmen had been sent for there and replied it was clear weather with him. No mention was made of the intermediate signal and he did not think there was justification for calling the fogmen appointed to it, but agreed it might have been wiser to do so.

"Obstruction danger" was received at 4.30 and he took steps to stop the down train then approaching. Shortly before he had been asked from Hitchin where the 3.25 train was and replied that it had cleared the track circuits of the intermediate signal.

The signalman at Hitchin South was working a 12 hr. shift, during the first four hours as train booker. At about 4.20 he arranged with the station inspector to call out the fogmen just before which the 2.28 train had been described. He could not then clear his distant for it owing to "indicator working" between the boxes at Hitchin and could not remember when he did so. At about 4.25 he heard the train and thought from the track diagram indications that it must be a very long one; becoming a little concerned, however, about the following train he spoke to "Stevenage," as above stated, and a moment later heard the collision. He replaced his up signals, then at clear for a freight train, operated the detonator placer and sent "obstruction danger." Being busy with other things he had not returned his down distant to normal until about a minute before the accident but should have done so 6 to 7 minutes earlier.

This evidence generally was confirmed by the signalman at the Yard box and the station inspector; the latter described the excellent arrangements made to call assistance and render first aid.

The driver of the 2.28 train said he passed Stevenage under clear signals and although he saw the auto signal off only at close range he observed Hitchin outer colour-light distant at a good one. He saw the inner distant semaphore at yellow and continued to reduce speed. The outer home was at green. The fog was getting bad and he was only crawling along. He stopped near the inner home and had to send his fireman to ascertain its indication; after starting forward he felt the collision. The guard, hearing another train coming, showed a red hand signal and was able to jump from the van in time.

The driver of the 3.25 train said it was foggy at Hatfield and worse from Knebworth. There was an "absolutely dense fog" at Stevenage starting signal, but he saw the two yellow lights. Running at 40 m.p.h. he tried to brake and gather the train and after passing Wymondley inner distant at yellow opened the sanders and put back the reversing gear ready; he kept applying and releasing the brake to try and pull up without snatching the train. At the auto stop signal, which he saw only on passing, he noticed an arm in the "off" position in the glare of the fire and took it to be his signal. He told the fireman he could release the hand brake. Releasing his steam brake he saw Hitchin outer distant at green but something seemed to warn him "that something was wrong," and although the inner distant was at green he ran slowly towards the outer home which was "off." He then saw a red light being waved ahead. He agreed that he must have seen the unlighted goods line signal at Wymondley. His suspicions became aroused on seeing the outer distant at green, for he would not have expected it to have been cleared so quickly. He did not stop, for he knew a passenger train to be following and ran at a safe speed forward. His fireman generally confirmed this evidence. He said the driver appeared to be dubious about the aspect of the auto stop signal, but he could not recollect anything being said that gave him that impression. The guard's evidence was vague and of little value.

The driver of the up train said he heard detonators at Hitchin South box, but could do nothing effective to avoid the collision.

### Tests and Inspections

As the driver of the colliding train had complained of the working of the brake, a test was carried out with his engine No. 92187, and a train made up as at the time of the accident. At Stevenage starting signal the regulator was closed and the steam brake fully applied; speed was 41 m.p.h. The train stopped in 1,240 yd., 116 yd. in rear of Wymondley stop signal. It was clear weather with dry rails. The train had not been gathered by partial brake applications, but the stop was gradual, without incident. Brigadier Langley inspected the signals by day and night, in clear and foggy weather. He found them all well sited for the down main line, visible at good range in clear weather. The auto stop signal stood out very clearly by day but from the cab of a freight engine on a clear night its red aspect was quite overpowered by the double yellow of Hitchin outer distant, 700 yd. away.

On the night of January 28, 1959, Brigadier Langley and Colonel Robertson accompanied the Line Traffic Manager, in the front of a diesel car with an excellent view ahead, on an inspection of all down main signals between Kings Cross and Doncaster to check whether there were other signals which might be "read through." There was dense fog in places; visibility ranged from over a mile to less than 5 yd. Speed was maintained at 40 m.p.h. except in fog when at times it had to be walking pace. With visibility at 300 yd. the Wymondley stop signal could not be "read through." The contrast between the semaphores and colour-lights was most marked. Although the former were well sited and easily located in clear weather one or two tended to be overpowered by the colour-lights, themselves all excellently sited about driver's eye level and seen at much longer distances than the semaphore oil lamps. The train was stopped at a tall signal post at the approach to Doncaster and an inspector had to climb it to ascertain its aspect in the fog. On the other hand a colour-light a short distance away in similar fog was visible at about 40 yd. Tests showed that on the night of the accident the whole of the signalling between Stevenage and Hitchin was in proper order; there was nothing to suggest any failure of the equipment.

### Chief Inspecting Officer's Conclusion

Brigadier Langley is satisfied that the Wymondley stop signal was at danger when the 3.25 train passed. In view of the evidence of more than one witness he has no hesitation in rejecting the driver's account of the weather conditions. His fireman said he himself saw the Stevenage starting signal and certain facts show he must have done so at a range of at least 180 yd. The driver clearly was not keeping a proper look out on approaching that signal and did not attempt to reduce speed until he passed it at double yellow. Thereafter he mismanaged the brake so that he was travelling too fast on reaching the auto stop signal. He did right to "gather the train" by a partial brake application, but should have followed it by a full one and reduced speed so as to be able to stop at the Wymondley signal. In view of the test made his excuse that the brake did not respond properly is not accepted. In Brigadier Langley's opinion the driver must have realised, shortly after passing this signal, that he had mistaken the unlighted goods line arm for the down main arm; instead of stopping, however, he continued forward without reducing speed. The accident was due to his failure to keep a proper lookout, to his mismanagement of the brake and serious misjudgment, after suspecting he had run by a stop signal. He is 60, with nearly 40 years railway service, 14 as driver with a good record until recently. About three weeks before this accident he was involved in a very similar incident; he approached a stop signal at too high a speed in dense fog and, although detonators were exploded, ran by for a long distance before realising his mistake, after which he continued to the next signalbox where he was stopped. These errors indicate his ability and judgment to be questionable.

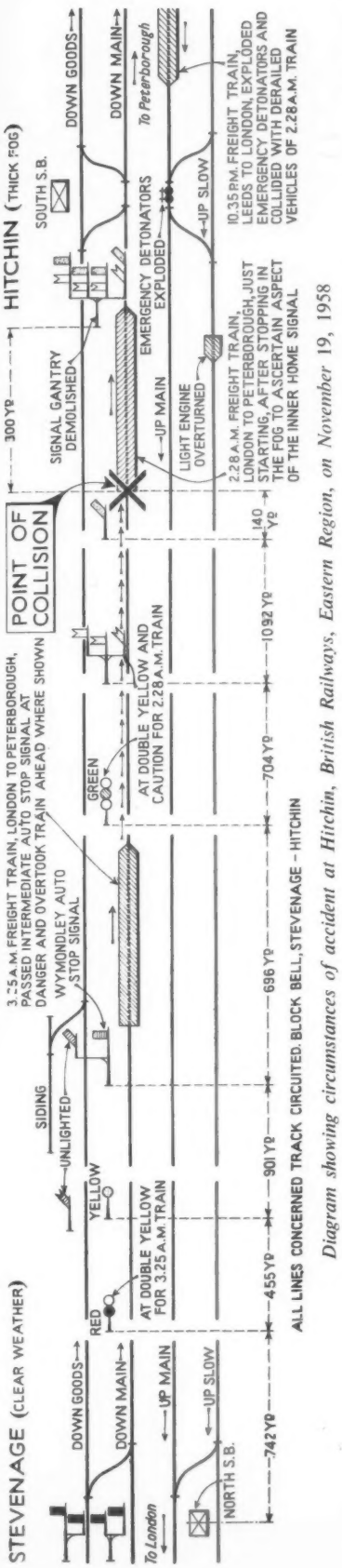

STEVENAGE (CLEAR WEATHER)
DOWN GOODS
DOWN MAIN
UP MAIN
UP SLOW
To London
NORTH S.B.
SIDING
UNLIGHTED
RED
YELLOW
3.25 A.M. FREIGHT TRAIN, LONDON TO PETERBOROUGH, PASSED INTERMEDIATE AUTO STOP SIGNAL AT DANGER AND OVERTOOK TRAIN AHEAD WHERE SHOWN
WYMONDLEY AUTO STOP SIGNAL
AT DOUBLE YELLOW FOR 3.25 A.M. TRAIN
GREEN
AT DOUBLE YELLOW AND CAUTION FOR 2.28 A.M. TRAIN
POINT OF COLLISION
HITCHIN (THICK FOG)
SOUTH S.B.
DOWN GOODS
DOWN MAIN
To Peterborough
UP SLOW
SIGNAL GANTRY DEMOLISHED
EMERGENCY DETONATORS EXPLODED
UP MAIN
LIGHT ENGINE OVERTURNED
2.28 A.M. FREIGHT TRAIN, LONDON TO PETERBOROUGH, JUST STARTING, AFTER STOPPING IN THE FOG TO ASCERTAIN ASPECT OF THE INNER HOME SIGNAL
10.35 P.M. FREIGHT TRAIN, LEEDS TO LONDON, EXPLODED EMERGENCY DETONATORS AND COLLIDED WITH DERAILED VEHICLES OF 2.28 A.M. TRAIN
300 Yds
140 Yds
1092 Yds
704 Yds
696 Yds
901 Yds
455 Yds
742 Yds
ALL LINES CONCERNED TRACK CIRCUITED. BLOCK BELL, STEVENAGE – HITCHIN

*Diagram showing circumstances of accident at Hitchin, British Railways, Eastern Region, on November 19, 1958*

The drivers of the 2.28 train and the up train acted correctly.

The failure of the signalman at Hitchin South to clear his distant signal directly that became possible delayed the first train unduly but should not have endangered it. He was seriously at fault in failing to return it to caution when the train reached the relevant track circuit at 4.22 or 23; he admitted he did not do so for some 6 to 7 min. He is 41 and had been on duty over 10 hr., no doubt beginning to tire. He had other work to do in his busy box but should not have allowed this to interfere with his fundamental duty of returning signals to normal as soon as possible after being passed.

With the weather so clear there it is understandable that the Stevenage North signalman considered it unnecessary to call the Wymondley fogman but since that man's post is half way to Hitchin it would have been prudent to do so when he heard that fogmen there had been sent for. Double block working then would have been introduced until the fogman reached the Wymondley signal, but this would not have affected the running of the 3.25 train.

### Remarks and Recommendations

Automatic train control ground inductors are in position for all distant and colour-light signals on the main lines between King's Cross and York, but the engine concerned in this case had no corresponding equipment. Had the driver received the additional audible warnings it might have alerted him to take more positive action. Over 220 steam and diesel locomotives have been equipped and others are being, at 20 per week. It is expected that by the end of the year the majority of drivers on this important line will have the benefit of this valuable warning device. Inspection demonstrated vividly the problems of working in fog and the relative effectiveness of semaphore and colour-light signals. Even when a semaphore could not be seen from the cab a nearby colour-light was identified without much difficulty. Extension of colour-lights to the East Coast main line is proceeding but it will be some years before modernisation of all the signalling is completed.

The Wymondley signal, installed many years ago, was well sited and originally one among a series of semaphores, but with the necessity for longer warnings for high speed trains many outer distants—usually colour-lights—were installed, leaving the Wymondley signal a lone semaphore among a group of such. This is unsatisfactory, especially at night, when the colour-lights tend to overpower the oil lamps, as inspection clearly demonstrated.

Four times since 1950 this signal has been over-run and it is proposed to replace it with a 3-aspect colour-light, acting also as outer distant for Hitchin, remove the then redundant Wymondley inner distant and the goods line stop and distant there, which should much improve and simplify the signalling.

Brigadier Langley is glad to report that the siting of all main line signals on the G.N. line will be examined to decide whether there are other like difficulties; such may exist elsewhere and it is suggested that a comparable review might be undertaken in other Regions.

The Stevenage North signalman was responsible for calling the Wymondley fogman. It would be prudent to do so whenever fog working obtains there or at Hitchin and the signalbox instructions have been amended accordingly. Similar arrangements might be made where such conditions exist elsewhere.

Although he made no complaint the Hitchin South signalman agreed that by 4 a.m. he was understandably somewhat tired, which may have accounted for his slow reactions about the first train and failure to return his distant signal to normal. Because most signalboxes have to be manned continuously, occasional 12 hr. shifts are inevitable, but their constant working is to be deprecated. When one must be, Brigadier Langley suggests, it should when practicable be planned so that the crucial early hours, when mental alertness is at its lowest, fall in the earlier period of duty. The difficulties at Hitchin South have now been overcome and normal hours been resumed. In some areas signalling staff still remains below establishment and some signalmen have to work frequent 12 hr. shifts. It is hoped, however, that further efforts will be made to eliminate this undesirable practice.

## Eastern Region Electrification News Bulletin

Passengers on the Eastern Region of British Railways who live in the areas affected by the forthcoming electrification of the North East London suburban lines from Liverpool Street to Chingford, Enfield, Hertford East, and Bishops Stortford have received a copy of a news bulletin, "Electrification News." It is the first of a series of information sheets which will be issued during the next 12 months to keep members of the travelling public fully in the picture regarding the final stages of electrification work, due for completion in September, 1960.

Report No. 1 contains a message from Mr. H. W. Few, Traffic Manager, Liverpool Street, giving a brief outline of the purpose of "Electrification News," and reviewing the coming year and the large scale engineering works that have still to be carried out. The main article and graph on the front page give further general detail on this £10,000,000 electrification scheme. On the back page, different facets of the main scheme are enlarged upon and illustrated with photographs and drawings.

A special edition of the news sheet has been prepared for stations beyond Bishops Stortford to Cambridge, for although outside the electrification area, the engineering work affects these trains. This edition contains a brief message from Mr. W. A. G. Suddaby, Traffic Manager, Cambridge.

## Irish Winter Train Services

Alterations in the train service between Dublin and Belfast, over the former Great Northern Railway main line, took effect from October 5; certain trains were being withdrawn and most of the remainder will be accelerated. The 7.30 a.m. from Dublin to Belfast runs only to Dundalk; the 9 a.m. express starts at 9.15 a.m. and reaches Belfast at 12.15 instead of 12.10 p.m. The 2.30 p.m. from Dublin starts at 2.45 p.m. and with accelerated running and considerably curtailed customs stops at Dundalk and Goraghwood is due Belfast at 5.40 instead of 6.5 p.m., a total acceleration of 40 min.

The 5.30 p.m. diesel "Enterprise," previously non-stop between the two capitals, calls at Dundalk at 6.28/6.29 p.m. to pick up passengers only, but still runs the 112.5 miles to Belfast in 130 min. The 6.25 p.m. from Dublin to Belfast runs only to Dundalk, and stops additionally at Balbriggan, Gormanston, and Laytown with no addition to its overall time.

Southbound, the former 6.30 a.m. from Belfast has been cancelled north of Dundalk, whence it leaves 3 min. earlier, at 8.15 a.m., arriving in Dublin at 8.58 a.m. The 8.15 a.m. from Belfast reaches Dublin 10 min. earlier, at 11.5 a.m.

Another cancellation has been that of the

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12 noon from Belfast to Dublin, but the southbound 3 p.m. starts at 2.15 p.m., and reaches Dublin at 5.5 p.m., an acceleration of 25 min. The 6 p.m. from Belfast is due in Dublin 10 min. earlier, at 9.5 p.m.

The times of all the non-stop runs over the 31.7 miles between Dublin and Drogheda are reduced to 34 min. northbound, and 35 min. southbound from the previous 39 and 38-40 min., respectively.

### C.I.E. Services

The winter service of Coras Iompair Eireann came into operation on September 14, and shows few changes. Certain alterations introduced during the summer are being continued for the winter, such as the Portarlington stop of the 7.50 a.m. (former 7.55) from Cork to Dublin, and the 5.10 p.m. start from Cork of the former 6.15 p.m. stopping train to Limerick Junction, so that it may connect at the latter with the 6 p.m. diesel express from Cork to Dublin.

On the main line of the former Dublin & South Eastern Railway the 11.35 a.m. from Westland Row to Rosslare Harbour now starts at 10.15 a.m., and reaches Wexford North at 1.22 p.m., 78 min. earlier, and Rosslare Harbour at 2.5 instead of 3.57 p.m., 112 min. earlier. The evening train over the same route has gone back to its normal winter working, without the summer relief stopping train as far as Arklow; the former, therefore, leaves Westland Row at 6.45 instead of 7.25 p.m., calls at all stations between Bray and Arklow, and is unchanged in arrival at Wexford and Rosslare Harbour.

## B.R. Officers Visit Diesel Works

The occasion of the completion recently by Vickers Armstrong (Engineers) Limited of the 100th Sulzer rail-traction diesel engine for British Railways was marked by a visit on September 30 to the works at Barrow-in-Furness of a party of senior officers of the British Transport Commission (British Railways Central Staff) and from Regions of British Railways.

The illustration shows engine components being examined by members of the party including, in the front row (left to right): Mr. W. J. A. Sykes, Chief Mechanical & Electrical Engineer, Southern Region; Mr. S. B. Warder, Chief Electrical Engineer, B.T.C. (B.R. Central Staff); Mr. R. F. W. Keay, Works Manager, Vickers Armstrong (Engineers) Limited; and Mr. J. F. Harrison, Chief Mechanical Engineer, B.T.C. (B.R. Central Staff). The party also included Mr. T. C. B. Miller, Chief Mechanical & Electrical Engineer, Eastern Region, and Mr. H. S. Smyth, Electrical Engineer, Southern Region.

The 100th engine inspected is a six-cylinder 6LDA28 developing 1,160 b.h.p. at 750 r.p.m., one of 198 being delivered to British Railways for Type "2" locomotives. It was destined for Crewe Works for a locomotive of the D5000 series for service in the Eastern Region and based on Ipswich. Thirty such locomotives will be used on passenger services and general freight train working in the Ipswich area.

### Eight-Cylinder Engines Also Inspected

The party also saw the first production models of the 77 eight-cylinder 8LDA28 engines which will power B.R. Type "3" locomotives being constructed by the Birmingham Railway Carriage & Wagon Co. Ltd. B.R. orders placed with Sulzer Bros. (London) Ltd., include 147 12-cylinder double-bank 12LDA28 engines suitable for outputs of up to 2,500 b.h.p.

The production rate of engines at Barrow is at present 12 a month but will soon be 16 and may be increased still further.

*Members of the party of British Railways senior officers being shown Sulzer engine components at the works of Vickers Armstrong (Engineers) Limited*

## Bridge Rebuilding at Coventry

Two overline bridges at Stoney Road and Warwick Road, Coventry, British Railways, London Midland Region, are to be rebuilt and preliminary work has already begun at Stoney Road. The rebuilding will allow the tracks to be remodelled in connection with the new Coventry Station and parcels office and at the same time provide adequate headroom under the bridges for electrification. The work has been so planned that road traffic will not be disrupted.

The north span of Stoney Road Bridge is 69 ft. 3½ in. long and the south span 96 ft. The width of the bridge between parapets is 40 ft. The parapets will be of pre-stressed concrete, being stressed vertically to the deck, the inside faces having an embossed patterned face and the outside faces exposed aggregate.

Street lighting will be of tubular strip lights accommodated in recesses at the top of the inside faces of the parapets, and will run for the whole length of the bridge. Because the new bridge at the north end overlaps the existing bridge by approximately half its width, the eastern half of the new bridge will be constructed first, the road traffic meanwhile passing over the existing bridge. On completion of the first half, single lane road traffic will be diverted over it and then the existing bridge will be removed and the second half completed.

### Warwick Road Bridge

Warwick Road Bridge will have one simply supported span 81 ft. long and the width between parapets will be 80 ft. (20 ft. wider than the existing bridge). The parapets are similar to those on the Stoney Road Bridge except that there is no provision for tubular strip lights as the street lighting is provided by lamp standards at both ends of the bridge.

There are a number of electricity and telephone cables in the eastern side of this bridge and these will be placed over a temporary steel bridge which will be erected before the bridge construction commences. The cables will be replaced in the new bridge after its completion.

The eastern half of the new bridge will be constructed first, the road traffic meanwhile using a restricted width over the existing bridge. On completion of the first half, road traffic will be diverted over it and then the existing bridge will be removed and the second half of the bridge completed.

## Automatic Retarder Control

Systems of automatic retarder control such as are in use at Thornton and Temple Mills marshalling yards are capable of further elaboration so as to reduce to an even greater degree the share of human operators in controlling the working. According to a scheme described by the General Railway Signal Company, of Rochester 2, New York, in the specification of a recent patent,* both primary (or hump) and secondary (group) retarders are automatically controlled, and units called "modifiers" respond to information fed in from various sources in such a way that wagon exit speeds from the retarders are adjusted to meet a variety of conditions. Much of this information is fed in by automatic means, but a manual control might be used by which an operator could inject certain correcting factors into the computing circuits.

Speed measurements of wagons in the controlled zone are made by v.h.f. transmitter-receivers using the Doppler frequency shift effect. A first measurement is made as wagons approach the hump retarder. The difference between the transmitted and received frequencies provides a signal proportional to speed and is applied, with a signal from a weighing device, to the retarder control relays. From this information the initial retarder pressure is adjusted for a predetermined speed of release. Speed measurements continue as the wagon passes through the retarder and are now passed, with the weight, to the retarder leaving circuits. Provision is made for varying the leaving speed by operating manual controls which cause the leaving speed selecting circuits to make allowance for factors such as a strong head wind or the running characteristics of light wagons.

### Release of Retarder

The retarder is released in two steps, the first governed by an "anticipation" relay when the wagon speed approaches the intended release speed, and the second when the desired release speed is reached. It is claimed that in this way a release speed closer to the desired value is obtained than

* British patent No. 816,163.

if the retarder had to open fully in one operation.

A further v.h.f. transmission is beamed on the receding wagon or cut as it leaves the hump retarder and runs towards the selected group retarder. The speed measurement so obtained is set up as a multi-digit code and is transferred forward as the wagons run through successive track circuits on their way to the group retarder. This information is used at the group retarder, in conjunction with length-of-cut and weight measurements, to establish a voltage $V_1$ corresponding to the expected entry speed of the wagon at the retarder. The voltage passes to a modifier, where it is compared with a voltage $V_2$ proportional to the actual approach speed as measured by further v.h.f. Doppler equipment beamed from the retarder towards the approaching wagons. Thus a third, or difference, voltage $V_3$ is obtained which represents the " rollability " of the wagon or cut.

Voltage $V_3$ is then multiplied by a factor depending on the route to be followed by the wagon on leaving the group retarder (derived from the signalling circuits) and may be further modified manually or automatically according to the number of wagons already standing in the siding into which the cut is to run. It is then used to adjust the wagon speed at which the retarder release relays operate. If, however, a wagon enters the retarder at the expected, or " reference " speed calculated from its speed of leaving the hump retarder, voltages $V_1$ and $V_2$ are the same and the release speed is calculated by circuits fed with route information from the signalling relays and with weight information from the weight detector at the approach to the group retarder.

# Contracts and Tenders

*Rolling Stock for the New Zealand Government Railways*

The New Zealand Government Railways has placed a contract with Charles Roberts & Co. Ltd. for 500 steel covered goods wagons, type " Kc."

Canadian National Railways has placed contracts to the value of $3,675,000 as follow:—

General Motors Diesel Limited: nine 1,200 h.p. main-line diesel shunting locomotives, for delivery in February and March, 1960

Marine Industries Limited: 100 50-ton flat wagons to be delivered by December of this year

National Steel Car Corporation Limited: 15 steam-generator units.

The Hymatic Engineering Co. Ltd. has received an order from the Greek Government for 12 type " 98P100" mobile air compressors with pneumatic tools. This model was originally developed for British Railways permanent way maintenance and has since been sold in increasing numbers throughout the world.

British Railways, Eastern Region, has placed the following contracts :

Wellerman Bros Ltd.: reconstruction of portion of sub-structure of underline bridge No. 257 over River Gipping bebetween Bramford and Claydon

Standard Telephones & Cables Limited : supply and installation of traffic control circuit transmission equipment, in connection with the electrification of the London, Tilbury, and Southend Line

Holmpress Piles Limited : construction of bored *in situ* concrete piles in existing platforms for new station buildings foundations at Barking

R. G. Horton (Engineers) Limited : reconstruction of portion of superstructure of overbridge No. 17 over main lines at Renishaw Central Station

Brightside Heating & Engineering Co. Ltd. : supply and installation of boiler plant, heating system, oil storage equipment, and all piping at diesel maintenance depot, Norwich

Lorne Stewart (Heating) Limited : works in connection with reconstruction of tranship shed at Spitalfields Goods Depot

Carter-Horseley (Engineers) Limited : repairs to spans Nos. 3 to 10 of bridge No. 5 between Peakirk and St. James Deeping, and to main girders and flooring of underbridge No. 1837, between Whittlesea and Peterborough East

R. Ridd & Son (Contractors) Ltd.: cleaning and painting of buildings and structures at station and adjoining landing stage, goods depot, and carriage sidings at Tilbury Riverside.

British Railways, North Eastern Region, has placed the following contracts:

Greensitt Bros. Ltd.: building work in connection with the heating installation in the new Traffic Manager's Office at Newcastle Central Station

Albert Innes Limited : electric lighting installation at the diesel depot, Leeds Neville Hill.

Arthur R. Farrar: renewal of lighting and power cabling at Farnley Motive Power Depot

Cowens Sheldon & Co. Ltd. : provision of capstans at Hull English Street Goods Depot

W. Wadsworth & Sons Ltd.: replacement of a goods lift at Mytholmroyd Passenger Station

Holmpress Piles Limited: piling work on bridge No. 21 at Alne on the main line north of York

George Simpson & Co. Ltd.: pipework for a compressed-air installation at Leeds Neville Hill Motive Power Depot

B. T. Allison : painting of 99 houses at Blaydon

Weston & Co. Ltd.: sandwich cladding at York Central Concrete Depot

Williams & Williams Limited: glazing work at York Central Concrete Depot

Wingrove & Rogers Limited: provision of a fork lift truck at Frisinghall

Dow-Mac Products Limited: provision of pre-stressed concrete beams for bridge No. 82 on the main line at Moorhouse (Cowton) south of Darlington

Wellerman Bros. Ltd. : provision of steel sheet piling for bridge No. 21 at Alne on the main line north of York

Compactors Engineering Limited: one Vibrosoil compactor for the Chief Civil Engineers Department, York

Dunlop & Ranken Limited: steel framework, sheeting, glazing, and ancillary builders work at Leeds Wellington Street Goods Depot.

The Special Register Information Service Export Services Branch, Board of Trade, has received calls for tenders as follow:

*From Egypt :*

10,000 *tonnes* of 52-kg. flat bottom rail.

The issuing authority is the Egyptian Republic Railways. The tender No. is E.R. 302G. 3/115. Bids should be sent to the Purchases & Stores Department, Railway Building, Fifth Floor, over Shoubra Subway, Shoubra, Cairo. The closing date is October 28, 1959. The Board of Trade reference is ESB/23463/59.

120 *tonnes* of steel fishplates for 52-kg. rails.

The issuing authority is the Egyptian Republic Railways. The tender No. is E.R. 302G. 3/117. Bids should be sent to the Purchases & Stores Department, Railway Building, Fifth Floor over Shoubra Subway, Shoubra, Cairo. The closing date is October 24, 1959. The Board of Trade reference is ESB/23462/59.

*From Formosa :*

79 locomotive axles, T.R.A. drawing No. 1-354, with material to specification JIS SFA-55.

The issuing authority and address to which bids should be sent is the Central Trust of China, Purchasing Department, 68, Yen Ping Nan Lu, Taipei, Taiwan. The tender No. is GFA-6122. The closing date is October 16, 1959. The Board of Trade reference is ESB/23795/59.

3,070 locomotive boiler tubes, to various dimensions.

The issuing authority and address to which bids should be sent is the Central Trust of China, Purchasing Department, 68, Yen Ping Nan Lu, Taipei, Taiwan. The tender No. is GFA-6143. The closing date is October 20, 1959. The Board of Trade reference is ESB/24247/59.

Further details relating to the above tenders together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1.).

BRITISH RAILWAYS DISPLAY AT INTERNATIONAL CLEAN AIR EXHIBITION.—Modernisation of the railways as an aid to air purification will be the theme of the British Railways exhibit at the International Clean Air Exhibition at the Seymour Hall, London, W.1, on October 20-22. There will be a display of photographic enlargements and typescript illustrating how British Railways can help in the clean air scheme by adopting diesel and electric traction, installing modern heating appliances, and instructing staff in reducing smoke from steam locomotives. A working model also will be shown of a British Railways Type " 1 " diesel-electric locomotive supplied by the British-Thomson Houston Co., Ltd. as main contractor.

ORE UNLOADERS FOR ROTTERDAM.—A large ore handling plant has been commissioned in the Rotterdam Waal Port, at the estuary of the Rhine, for the NV Stuwadoors Maatschappij Kruwal to serve the steel works on the Lower Rhine whose ore requirements have increased considerably over the last few years. The plant comprises two travelling unloaders of 230-ft. span with a 148-ft. long hinged apron on the waterside and 16-ton capacity man-trolleys which unload the ore arriving in seagoing ships from Scandinavia, Spain, Venezuela, and Brazil into river barges. This new plant handles 5,000,000 tons of ore a year for delivery to the steel mills on the Lower Rhine. Two of the four unloaders have been supplied by Maschinenfabrik Augsburg-Nürnberg AG.

## Notes and News

**New Institute of Transport Graduate & Student Society.**—The Council of the Institute of Transport has given approval for the formation of a Port Talbot and District Graduate & Student Society within the area of the South Wales and Monmouthshire Section.

**Algoma Central & Hudson Bay Railway Company.**—The gross operating income of the Algoma Central & Hudson Bay Railway Company for August was $1,113,058, a decrease of $130,591. The aggregate from January 1 was $7,324,715, an increase of $114,749.

**Trans-Zambesia Railway Co. Ltd.**—Gross receipts of the Trans-Zambesia Railway Co. Ltd. for 1958, amounted to £1,107,571 (£1,067,292). Working expenses were £829,227 (£790,021), net receipts £278,344 (£277,271). The first debenture £75,000 (same) is available for the full interest on the 5 per cent income debenture. The meeting is on October 28 in London.

**Improvements at St. Albans City Station, London Midland Region.**—Work is to begin soon on improvements to St. Albans City Station, British Railways, London Midland Region, which will give additional cycle accommodation and provide more room for parcels. A prefabricated building is to be erected as the booking office, and the present one will become the accounts office. Cockroft & Preece Limited, St. Albans, is the contractor for the work.

**Philips Fluorescent Lamps.**—All fluorescent lamps produced by Philips Electrical Limited, in standard ratings (15w. to 80w., white colours; also reflectalite) are now provided with both an external earthing strip and a silicone coating. These lamps are suitable for operation on both switch start and instant start circuits, but no extra charge is made for the special construction. Provision of both forms of starting aid is claimed as exclusive to Philips. The metal earthing strip gives greater starting reliability especially on low voltages and in cold weather, but the strip is ineffective if the lamp is used in fittings with non-earthed lampholders; and for these installations lamps with silicone coating are required. Philips Electrical Limited recommends that makers of fittings continue to provide earthed lampholders, *i.e.* that the lamp should still be operated as an earth-strip type, the silicone-coating properties being left in reserve.

**Vickers Limited Dividends.**—An interim ordinary dividend of 2½ per cent, less tax, is to be paid by Vickers Limited in respect of the year 1959.

**Elbourne Memorial Lecture, B.I.M.**—Mr. Harold Wilmot, Vice-President of the British Institute of Management and Chairman & Managing Director of Beyer, Peacock & Co. Ltd., will take "The Management Burden" as his subject in giving his fifth Elbourne Memorial Lecture under the auspices of the British Institute of Management at 8 p.m. on October 30, at the Royal Commonwealth Society, Northumberland Avenue, W.C.2. The Elbourne Memorial Lecture was inaugurated in 1955 to perpetuate the memory of Edward T. Elbourne, founder of the Institute of Industrial Administration.

**Road Accidents in 1958.**—A report published by H.M. Stationery Office at 5s., "Road Accidents, 1958," states that there were 237,265 accidents last year, involving personal injury. Of the vehicles involved in accidents 22 per cent were motor cycles, scooters, or mopeds. These vehicles accounted for 7 per cent of the vehicle mileage. The number of persons killed on the roads in 1958 was 5,970, compared with 5,550 in 1957, and the total number of killed and injured 299,767 (273,858).

**Ghana Supply Commission.**—The Ghana Government is setting up a Ghana Supply Commission w' ich is to assume, gradually, the functions at present exercised on behalf of the Government by the Crown Agents in London. It is also to assume similar functions at present exercised by existing government authorities in regard to orders placed by local firms. United Kingdom manufacturers and export houses interested in supplying goods to Ghana are advised to sent details of their manufactures by means of catalogues, journals, directories, and so on, to the Commission and to include them on future mailing lists. The address of the Commission is the Office of the Ghana Supply Commission, P.O. Box N.35, Ministry Branch Post Office, Accra, Ghana. The Chief Executive Officer is a Mr. J. S. Mongia and the Secretary is Mr. G. W. Humphrey Akumi.

**Institute of Transport Week-end Course at Oxford.**—Following the successful week-end course at Magdalen College last September, the Institute of Transport has announced a similar course at New College, Oxford, for the week-end September 16 to 19, 1960. The course will be open to all grades of Institute members to whom particulars, with booking forms, will be circulated in due course.

**Record Sale of Rover Bus Tickets.**—London Transport Executive 5s. Rover bus tickets, which give a day's unlimited travel, had had a record sale of over 500,000 by the end of September, largely as result of the fine summer. The biggest sale, 347,000, has been in Green Rovers, which can be used any day of the week on country bus services. The sale of Red Rovers, sold for week-end trips on central buses and trolley-buses, totalled over 200,000.

**Information for Railway Staff on Re-appraisal of Modernisation Plan.**—The staff of British Railways, Eastern Region, now has an opportunity of seeing a film in which Sir Brian Robertson, Chairman of the British Transport Commission, speaks on the re-appraisal of the plan for modernisation and re-equipment of British Railways. The film is being shown at all main centres in the Region. Cinema vans cover outlying areas. Copies of a summary of the White Paper giving details of the re-appraisal are available to all staff, as is the White Paper itself on special request.

**Associated Electrical Industries S.A. (Pty.) Limited Merger.**—Associated Electrical Industries, S.A. (Pty.) Limited has announced that it will take over as from November 1, the assets and liabilities of the British Thomson-Houston Co. S.A. (Pty.) Limited, and Metropolitan Vickers S.A. (Pty.) Limited.

## Diesel Operation in the Eastern Region

Photo] [*M. W. Earley*

*Kings Cross-Hull express train hauled by the English Electric Co. Ltd. 3,300 h.p. "Deltic" locomotive passing Holme, British Railways, Eastern Region*

Mr. L. G. Axe, a director of the new parent company, has stated that the merger and integration have resulted from a similar operation in the United Kingdom. The parent companies of both British Thomson-Houston and Metropolitan Vickers were constituent members of Associated Electrical Industries which was founded in 1929. Mr. David Stanley, previously Managing Director of Metropolitan Vickers, will be Chairman & Managing Director of the new company. Staffs of both South African companies will be absorbed to preserve continuity of service.

**Institute of Transport Visual Aids Meeting.**—A visual aids meeting of the Institute of Transport will take place at 6.15 p.m. on October 20, 1959, at 80 Portland Place, London, W.1, when three films: "Under the River," "Journey from the East," and "Port of London," will be viewed and discussed. The meeting is open to members of all grades and to visitors.

**India General Navigation & Railway Co. Ltd.**—There will be no dividend for 1958 on ordinary or preference stocks of the India General Navigation & Railway Co. Ltd. This is the same result as the previous year. Profit is £65,674 after depreciation £145,760 (£142,273), compared with a loss of £86,113 which included a credit adjustment of £11,523 in respect of previous years.

**Aluminium Union Limited, Change of Name.**—Aluminium Union Limited has changed its name to Alcan (U.K.) Limited. Aluminium Union Limited for many years has been the United Kingdom distributing company for the aluminium ingot and magnesium, bauxite, and chemicals produced by its associated companies in Aluminium Limited of Canada. The ingot metal bears the trade name Alcan and the Canadian producer has also come to be known by that name throughout the world.

**London Transport Bus-Rail Timetable Booklets Delayed.**—Owing to the effects of the recent printing dispute, many new local bus-rail complete timetable booklets cannot be published by London Transport in time for the winter services of country buses and Green Line coaches which start on October 14. The new bus timetables will be displayed in time for October 14, on the bus stops of all routes concerned and extra copies of these have been printed for issue to passengers on request from local country bus garages.

**Goods Depot Closures in the London Midland Region.**—British Railways, London Midland Region, has announced that Entwistle goods depot, between Bolton and Blackburn and Ewood Bridge & Edenfield depot, between Bury and Bacup are to close on November 2. Small consignments of traffic by freight train will be dealt with at Bolton Manchester Road Station. Full loads of freight train traffic and livestock will be dealt with at Turton & Edgworth for Entwistle, and at Rawtenstall for Ewood Bridge & Edenfield.

**Closure of Beccles-Yarmouth Line.**—The passenger and goods service will be withdrawn on November 2 between Beccles and Yarmouth South Town via Belton & Burgh. The intermediate stations, Belton & Burgh, St. Olaves, and Haddiscoe High Level, will be closed to all traffic. Aldeby will be closed for passenger traffic. Passengers between Beccles and Yarmouth South Town can travel by the alternative route via Gorleston-on-Sea. Passengers now using the intermediate stations on the Beccles-Yarmouth line via Belton & Burgh will be catered for by bus services operating in the area. Existing parcels and goods facilities will continue to be available at Beccles, Haddiscoe Low Level, and Yarmouth South Town. Goods traffic in full wagon loads will continue to be dealt with at Aldeby, which station will be served by a goods spur from Haddiscoe Low Level via Fleet Junction. A C. & D. service for parcels and sundries traffic will continue to operate in the areas now served by Aldeby, St. Olaves, and Belton & Burgh stations.

**Names of Dexion Products Changed.**—Dexion Limited, the manufacturer of slotted angle and accessories, has changed the name of two products. Tecton is the new name for engineered wood beams previously known as Tecon. Open Steel Plank replaces the name Multi-Purpose-Grid for the recently introduced all-purpose grid intended for floors, steps, ramps, and so on.

**Two London Midland Region Steam Locomotives Named.**—Two steam locomotives of British Railways, London Midland Region, hitherto nameless, have been fitted with nameplates. They are "Britannia" Class locomotive No. 70046 *Anzac*, and "Patriot" No. 45528 *Reme*. The former name was suggested by an enthusiast in Leith and the latter by a Southern Region signalman.

**British Railways Information Bureau at the Motor Show.**—British Railways Information Bureau at the forthcoming International Motor Show to be held at Earls Court from October 21 – 31, will feature a display of photographs illustrating British Railways' services to the motorist and the motorcar export industry, and a model of the Western Region Maybach—engine diesel-hydraulic locomotive. Representatives of British Railways will be at the enquiry counter to answer visitors' questions about passenger and freight train services, fares, rates and charges, and on travel to and from the Continent.

**Symposium on Electron-Microscopic Examination of Metals.**—A one-day symposium on "The Application of Thin-Film Techniques to the Electron-Microscopic Examination of Metals," arranged by the Metal Physics Committee of The Institute of Metals, will be held on November 12, at the Royal Institution, 21 Albemarle Street, London, W.1, beginning at 9.30 a.m. Eight papers will be presented and discussed. Visitors will be welcome and no tickets are required. Copies of the papers, published in the August issue of the "Journal of the Institute of Metals," are obtainable, price £1, from the Secretary, The Institute of Metals, 17, Belgrave Square, S.W.1.

**Closure of Pilsley Station, London Midland Region.**—British Railways, London Midland Region, has announced that Pilsley Station, between Hucknall Central and Chesterfield Central, is to be closed on November 2, 1959. Passengers should book to Tibshelf Town, Heath, Chesterfield, Alfreton, or Mansfield, according to direction of travel, and thence by buses of the Midland General Omnibus Co. Ltd. Parcels and passenger train merchandise will be dealt with at Tibshelf Town Station, small consignments of traffic by freight train at Mansfield Town Station, and full loads of freight train traffic at Tibshelf Town Station. Only full loads of freight train traffic for private sidings will continue to be received at Pilsley.

**Safe-Driving Awards for London Country Busmen.**—Awards for safe driving in 1958 have been gained by 1,870 drivers of the country (green) bus and Green Line coach fleet of London Transport. These awards, made by the Road Operators' Safety Council, are being presented at ceremonies held locally. A 31-34 year bronze bar has been awarded to one driver and another driver has gained a brooch for 30 consecutive years of safe driving. The awards also include 158 21-24 year star bars, 204 16-19 year special bars, and 279 11-14 year oak leaf bars.

**Share Acquisition by Wickman Limited, South African Subsidiary.**—The South African subsidiary of Wickman Limited, machine tool makers, has acquired more than 90 per cent of the ordinary shares of D. Drury & Co. Ltd., engineering suppliers of Johannesburg.

**Charles Roberts & Co. Ltd. Results.**—The group profit before tax of Charles Roberts & Co. Ltd. for the year ended March 31, 1959, amounted to £490,197 (£381,769). This amount includes £129,272 contributed by Hurst Nelson & Co. Ltd. which was acquired on April 1, 1958. The tax paid amounted to £237,644 (£229,010) leaving a net profit of £252,553 (£152,759).

**Hymatic Engineering Co. Ltd., at the Building Exhibition, Olympia.**—Hymatic-Hydrovane mobile and portable air compressors will be shown at the Building Exhibition at Olympia, London, W., on November 18 – December 2. Electrically-driven Hydrovane compressors to be demonstrated will include the new model 90E100. This powers four light pneumatic hammer drills or one heavy concrete breaker, but can be easily moved round buildings. Single-tool and two-tool portable Hydrovane compressors driven by petrol and diesel engines for building and contracting work will be displayed, with small petrol-engined compressors suitable for light pneumatic tools and spray painting.

**Small & Parkes Limited at Scottish Motor Show.**—Don friction materials manufactured by Small & Parkes Limited will be exhibited at the Scottish Motor Show to be held at Kelvin Hall, Glasgow, on November 13–21. Brake linings and clutch facings will be shown made in metallic and non-metallic woven asbestos and in moulded asbestos of varying qualities to suit particular applications. Sinter-Don metal friction materials for use in automobile automatic transmissions, Donvee fan and dynamo belts, Railite radiator hose and Karmal packing and jointing will also be on exhibition.

**Mond Nickel Co. Ltd., Southampton Exhibition.**—An exhibition, to which over 12,000 designers and technologists have been invited, is being staged by the Mond Nickel Co. Ltd., at Marlands Hall, Havelock Road, Southampton, from October 27 to 30. The exhibition features the properties of nickel, nickel-containing materials, and the platinum metals. Mond Nickel Co. Ltd. is featuring the range of company products and illustrating the special properties which make them vital materials for many applications in modern industry. The exhibition is divided into sections dealing with mechanical and physical properties, corrosion-resistance, electrodeposition, strength at high temperatures, toughness at sub-zero temperatures, and welding. These main sections are further sub-divided and include working demonstrations, illustrations and specimens of materials.

**Head Wrightson & Co. Ltd. Scrip Issue Proposal.**—The directors of Head Wrightson & Co. Ltd., have decided to recommend the capitalisation of some £885,937 out of revenue reserves for general purposes, and the distribution of one fully paid ordinary share of 5s. for every two ordinary shares held at the close of business on October 12, 1959. Meetings will be convened for November 12, 1959, at which resolutions for increasing the capital to £3,500,000, by the creation of

4,000,000 ordinary shares of 5s. each will also be considered. The directors forecast a total dividend for the year ending January 31, 1960, of 14 per cent on the increased capital against 13¼ per cent equivalent, although they expect lower profits for the period.

**Corrosion Group Exhibits for 1960 Conversazione.**—The Corrosion Group of the Society of Chemical Industry is inviting offers of exhibits illustrating the progress of research and development in any aspect of metallic corrosion and its prevention for showing at the Group Conversazione at Battersea College of Technology on January 21, 1960.

**Dowty Travelling Demonstration Van Visits London.**—Demonstrations of Dowty equipment were given last week in London, at Stratford and Bounds Green, from a travelling road-motor van. The van has been specially equipped by Dowty Hydraulic Units Limited for the purpose of explaining the principles and servicing of Dowty hydraulic buffers and other products. Facilities were provided by British Railways for the showing of films to supplement the practical demonstrations.

## Forthcoming Meetings

October 19 (*Mon.*).—Railway Correspondence & Travel Society, West Midlands Branch, at 64, Holyhead Road, Coventry, at 7.30 p.m. Paper on "Railway highlights of 1958," by Mr. W. A. Camwell.

October 20 (*Tue.*).—The Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, 1, Birdcage Walk, Westminster, S.W.1, at 5.30 p.m. Paper on "Aluminium technology and railway rolling stock," by Mr. K. P. Brockway.

October 21 (*Wed.*).—The Institute of Fuel, at the Institution of Civil Engineers, Great George Street, London, S.W.1, at 5.30 p.m. Paper on "The use of oxygen in combustion processes with particular reference to the steel industry," by Mr. T. C. Churcher, British Oxygen Research & Development Limited.

October 21 (*Wed.*).—Permanent Way Institution, London Section, at the Headquarters of the British Transport Commission, 222, Marylebone Road, N.W.1, at 6.30 p.m. Paper on "The use of track tampers," illustrated, by Mr. D. G. C. Walker.

October 21 (*Wed.*).—Peterborough Railway Discussion Group, at Eastfield Road, at 6.45 p.m. Paper on "Temple Mills—does it ?" by Mr. H. W. Few, Traffic Manager, Eastern Region, Liverpool Street.

October 22 (*Thur.*).—Institute of Transport, South Eastern Group, at the Saracen's Head, Ashford, at 7.15 p.m. Paper on "Some impacts of air and road transport on railway economics and practices," by Mr. C. E. Whitworth.

October 22 (*Thur.*).—British Railways, Western Region, London Lecture and Debating Society, in the headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, W.2, at 5.45 p.m. Paper on "Development of an industry—the story of T. Wall & Sons Ltd.," by Mr. C. W. Road, member of Western Area Board of the B.T.C.

October 22 (*Thur.*).—Institution of Civil Engineers, at Great George Street, Westminster, S.W.1, at 5.30 p.m. Informal discussion on "The problems of measurement on civil engineering works," introduced by Mr. James Martin and Mr. B. K. Clancy.

October 24 (*Fri.*).—Institution of Railway Signal Engineers, Bristol Section. Visit to Severn Tunnel Hump Yard and the tunnel pumping station at Sudbrook.

October 27 (*Tue.*).—Railway Correspondence & Travel Society, East Midlands Branch at the N.C.S. Guild Room, Toll Street, Nottingham, at 7.30 p.m. Display of colour and black and white slides, by Mr. J. B. C. McCann.

October 28 (*Wed.*).—Peterborough Railway Discussion Group, at Eastfield Road, at 6.45 p.m. Paper on the "Port of Liverpool," by Mr. W. E. Sutton, Public Relations Officer, Mersey Docks & Harbour Board.

October 28 (*Wed.*).—British Railways, Southern Region Lecture & Debating Society, at the Chapter House, St. Thomas' Street, S.E.1, at 6 p.m. Paper on "Southampton Docks," illustrated, by Mr. S. A. Finnis, Chief Docks Manager.

## Railway Stock Market

Record activity and strength, concentrated on steel and industrial shares, was the immediate response of stock markets to the election result. Many shares reached all-time peak levels. The end of the threat of steel nationalisation and of a capital gains tax was regarded in the City as giving industry bigger scope for expansion, and the assumption is that higher dividends will be in prospect in due course.

Market activity did not extend to foreign and overseas railway stocks, but in general they were well maintained. Many gains were recorded among shares of locomotive builders and engineers. Sentiment tended to be influenced by the big gains in steel shares.

United of Havana second income stock was again quoted at 6 and San Paulo Railway 3s. units at 1s. 6d. Mexican Central "A" bearer debentures remained at 56. Brazil Railway bonds rose further from 6¼ to 7.

Antofagasta ordinary stock strengthened from 13½ to 14. The preference gained a point at 24, and the 5 per cent (Bolivia) debentures were fractionally higher at 93. Paraguay Central first debentures eased from 20 to 19. Costa Rica ordinary stock remained at 17½ and Chilean Northern 5 per cent debentures at 60.

Canadian Pacifics, influenced mainly by Wall Street, eased to $47¾, compared with $48⅞ a week ago, but the preference and debenture stocks, which are sterling securities, moved higher. The preference at 57 compared with 56¾ a week ago, and the debentures improved from 62¾ to 63....White Pass shares at $13¾ were the same as a week ago. Nyasaland Railways shares kept at 10s. 6d.: the 3½ per cent debentures eased to 53. West of India Portuguese capital stock was again quoted at 105½.

Reflecting the big rise in industrial shares, Westinghouse Brake were at the record level of 53s., compared with 49s. 9d. a week ago. Gloucester Wagon 10s. shares have been firm at 16s. 3d. and Wagon Repairs 5s. shares rose from 9s. 9d. to 10s. 3d. Beyer Peacock 5s. shares at 8s. 3d. compared with 8s. a week ago, and Charles Roberts 5s. shares rose from 13s. 6d. to 14s. 1½d. G. D. Peters remained around 18s. 1½d. and Birmingham Wagon at 30s. 1½d., but North British Locomotive moved up from 11s. to 12s. 4½d.

Associated Electrical have advanced from 60s. 6d. a week ago to 64s., and English Electric from 43s. 9d. to 48s. 6d. a new peak for the year. General Electric, also at the year's peak of 45s. compared with 39s. 9d. a week ago. Crompton Parkinson 5s. shares at 16s. 7½d. were at the best for the year; they were 14s. a week ago. T. W. Ward, helped by the end of the steel nationalisation threat, advanced to 115s. a gain of 14s. compared with a week ago. Ransomes & Marles 5s. shares held their rise to 23s. 6d., Pressed Steel 5s. shares have risen on balance from 33s. 3d. to 36s. 9d. and Dowty Group 10s. shares from 38s. 6d. to 40s. Edwards Vacuum 4s. shares jumped to 23s. 6d. Crofts Engineers 5s. shares to 19s. 3d., Alfred Herbert to 47s. 9d., and Mather & Platt to 49s. 9d. Tube Investments rose by 10s. to 106s. and Pollards Bearing 4s. shares to 34s. a record for the year. Vickers moved ahead to 30s. Murex were up to 55s. 9d. and Guest Keen to 77s. 9d. a gain of 7s. 6d. on balance. Stone-Platt rose 2s. 6d. to 51s. and Ruston & Hornsby gained 1s. 4½d. at 23s. 4½d. Here are some of the big rises in steel shares compared with a week ago. Dorman Long from 36s. to 48s. 9d.; Colvilles from 39s. 6d. to 52s. 3d.; Steel of Wales from 32s. 4½d. to 41s. 9d.; United Steel from 40s. 6d. to 55s.; Lancashire Steel from 24s. to 32s. 3d. and John Summers from 40s. 7½d. to 52s. 6d. The market view is that with the nationalisation threat removed, steel companies will follow somewhat more generous dividend policy and may raise money for expansion by rights issues to shareholders.


# OFFICIAL NOTICES

BRITISH TRANSPORT COMMISSION

BRITISH TRANSPORT COMMISSION require Senior Technical Assistant in the Chief Electrical Engineer's Department, 14, Melbury Terrace, N.W.1, to assist in design of electrical equipment for diesel electric traction. Capable of preparing detailed specifications, investigations into service conditions, and factual reports on equipment. Recognised engineering training, with Higher National Certificate or equivalent essential. Membership of a Professional Institution desirable.

Salary range : £1,200—£1,420.

Superannuation scheme. Certain travel facilities. Medical examination. Write stating age, qualifications and experience to Director of Establishment, British Transport Commission, 222, Marylebone Road, London, N.W.1, within 14 days.

LONDON TRANSPORT
CIVIL ENGINEERS
and
HEATING AND VENTILATING ENGINEERS

are required for office and site duties connected with the New Works Programme of railway capital works and modernisation schemes in the open and underground.

CIVIL ENGINEERS.—Salary ranges between £800 per annum and £1,800 per annum.

Occupants of the senior posts will be required to co-ordinate and direct the work of the staff in the other posts who will be concerned with the preparation of schemes, contract drawings and specifications.

Applicants should have had experience in positions concerned with the design, construction and maintenance of major civil engineering works, particularly railway works.

HEATING AND VENTILATING ENGINEERS.—Salary ranges between £1,000 per annum and £1,450 per annum.

Occupants of the senior posts will undertake design work themselves and will lead teams concerned with preliminary assessment, design, planning and installation. Occupants of the other posts will deal with all details of design and specification.

Applicants should be of a high standard of technical attainment and experience, which preferably should include experience of railway tunnel ventilation and of large fan installations.

Appointments are subject to medical examination. Successful applicants will qualify for certain free travel facilities and will be required to join a contributory superannuation fund after a probationary period.

Applications stating age and qualifications and giving full details of previous experience should be sent to:—Staff & Welfare Officer (F/EV 756/4), London Transport Executive, 55, Broadway, London, S.W.1.

FOR hire Hudswell Clarke 0-6-0 Standard Gauge Steam Loco. Apply Eagre Construction Co. Ltd., Scunthorpe, Lincs. Phone 4513—7 lines.